

EG 213 H21



Hamilton, FI The Basis of evolutionary
3 0513 0000 2781 9

Ameytham
Newman

Bernard Hamm

THE BASIS OF
EVOLUTIONARY FAITH

THE BASIS OF EVOLUTIONARY FAITH

A Critique of the Theory of Evolution

BY THE REVEREND
FLOYD E. HAMILTON, TH.M.

PROFESSOR OF BIBLE, UNION CHRISTIAN COLLEGE,
PYENGYANG, KOREA

Author of "The Basis of Christian Faith"



19312

LONDON
JAMES CLARKE & COMPANY, LIMITED
9 ESSEX STREET, STRAND, W.C.2

2 7658

Printed in Great Britain

S01326

421

TO THE LATE
REVEREND PROFESSOR B. B. WARFIELD,
D.D., LL.D., LITT.D.,
MY BELOVED TEACHER AND GUIDE.



Digitized by the Internet Archive
in 2023

https://archive.org/details/bwb_P4-AAT-951

PREFACE

DURING the last few years the religious and scientific worlds have been agitated over the subject of evolution. The militant opposition of the late William Jennings Bryan to the theory of evolution aroused public interest in the subject as never before, and stirred up the advocates of the theory of evolution to send forth a torrent of literature in its defence. A great deal of this literature in defence of evolution has been characterized by resentment against the "persecution of science by religious leaders," and by ridicule of those religious leaders who have no scientific standing, and yet who have had the temerity to oppose publicly the teaching of the theory of evolution as scientific fact, in schools supported by public funds.

Unfortunately the opponents of the theory have not always approached the subject with dispassionate fairness, and their indiscriminate opposition to all types of evolution and evolutionists has tended to antagonize evolutionary scientists, and to lose the sympathy of a large

Preface

section of the educated public. After all, the question of the truth or falsity of the theory of evolution is a question of fact, and can only be decided (if it can be decided at all) by a careful examination of the evidence. If it is true, Christians will have to make a place for it in their theory of the universe, whether they like it or not. If it is not true, scientists will sooner or later be forced to admit it, and will be forced to reconstruct a number of the sciences which have assumed the truth of evolution as their fundamental postulate. Under these circumstances it is the duty of both the friends and the foes of the theory to make an earnest endeavour to get at the real evidence on the subject, and to give it fair-minded consideration, confident that the truth can never be permanently suppressed, no matter how obscured it may be at times.

The writer has been forced to take his stand with the opponents of the theory, because the facts seemed to demand it. Such a stand meant, however, the giving up of a long cherished prejudice in favour of evolution, and taking a position with those who are looked upon by most scientists as cranks and fanatics. Such a change has not been easy for one educated in an atmosphere where the opinions of scientists were respected, and where evolution was one of the foundation stones of the various sciences. Had

Preface

the evidence seemed less conclusive, needless to say, the writer would never have abandoned the belief in evolution in which he was trained. It was simply the overwhelming weight of the evidence that forced the change of position.

Moreover, the writer would make it clear at the outset that he is not opposed to the right kind of "Christian Evolution," if the facts forced one to accept the evolutionary view of the origin of species. It was that kind of evolution that the writer himself believed in, before he became convinced that the facts were against it. While theoretically it might be possible to reconcile the Bible with a belief that God created the world of life through a process, guiding and directing the process throughout, interposing new beginnings at various stages in the process, creating man *de novo*, and sending His Son to earth to redeem fallen man, there are two serious difficulties in connection with such a view. In the first place the evidence seems to be against it. In the second place, almost no evolutionist of standing believes in such a view, so why bother with it?

While there are many able books which set forth the evidence against evolution, the writer feels that there are several points that have not been emphasized sufficiently, and some that have not been touched upon at all. This book,

Preface

therefore, is an attempt to set forth, briefly and clearly, fundamental weaknesses of the whole evolutionary position, and to present the evidence against the theory in as convincing a form as possible. It is the hope of the writer that many readers whose faith in Christ and the Bible has been weakened or destroyed by anti-Christian evolutionary teaching, may be led to see the weakness of the evidence in favour of evolution, and may recover their faith in God, in Christ, God's Son, and in the unchangeable facts of the Christian religion. If this book aids only one such person to recover his or her faith, it will have been worth while.

F.E.H.

Pyengyang, Korea. 1931

CONTENTS

CHAPTER	PAGE
I. THE PRESENT STATUS OF EVOLUTIONARY FAITH - - - - -	13
II. EVOLUTION AND SCIENTIFIC REPUTE -	24
III. SCIENTIFIC IMMUNITY FROM CRITICISM -	37
IV. THE BASIS OF THEOLOGIAN'S INTEREST IN EVOLUTION - - - - -	48
V. THE ORIGIN AND NATURE OF LIFE - -	61
VI. THE PRIMORDIAL CELL THEORY VERSUS MULTIPLE CREATIONISM - - - - -	87
VII. EVIDENCE FROM THE CHROMOSOMES -	95
VIII. EVIDENCE FROM GENETICS - - - -	105
IX. ALLEGED EVIDENCE FROM CLASSIFICATION	135
X. ALLEGED EVIDENCE FROM COMPARATIVE ANATOMY - - - - -	151
XI. THE ARGUMENT FROM EMBRYOLOGY -	158
XII. EVIDENCE FROM VESTIGIAL ORGANS -	170
XIII. THE NUTTALL BLOOD TESTS - - -	176
XIV. GEOGRAPHICAL DISTRIBUTION - - -	183
XV. EVIDENCE FROM PALÆONTOLOGY - -	193
XVI. CONCLUSION - - - - -	218

Belief in the FACT by
FAITH as there is no
modus operandi yet
discovered to cause
evolution.

CHAPTER I

THE PRESENT STATUS OF EVOLUTIONARY FAITH

STRANGE as it may seem, most scientists to-day regard evolution as a closed question. The majority of them see no reason whatever even for discussing a subject which they deem settled long ago, and they are inclined to be impatient and resentful at those who persist in making evolution a subject of controversy. They became convinced of the truth of evolution thirty years ago, and, using evolution as an assumption, proceeded to construct a number of sciences such as biology, geology, anthropology, etc., which to-day can hardly be taught on any other basis than that of the assumption of the truth of evolution.

In fact, it may almost be said that the correlation and systematization of facts bearing on the theory of evolution stopped with Herbert Spencer; for when the scientific world accepted evolution, there seemed no longer any reason to waste time proving it. With the development of scientific specialization, the evolutionary systematist became

Basis of Evolutionary Faith

an anachronism, and since it was no longer possible for a man to be an authority on *all* the sciences bearing on evolution, scientists ceased to attempt to correlate or to criticise the discoveries of colleagues in branches concerning which they had no first-hand knowledge.

With the advance in the technique of the microscope, even biology became too vast a field for one man to master in detail, and the various specialists found their time so largely taken up with detailed investigations that they actually had no time for investigation of discoveries outside their own special fields. Though facts bearing on the question of evolution were continually being discovered, for the most part they remained *unrelated* facts, for there was no great systematist, like Darwin, to show their relation to the evolutionary theory. Of course, parts of the theory of evolution had to be remodelled, but no one dreamed of abandoning the principle of evolution itself, for it had become an integral part of all these sciences, so that abandoning it would be almost like abandoning the sciences themselves.

The natural result of this general scientific attitude was that any re-examination of the evidence for evolution itself became practically impossible. It seemed almost like questioning the multiplication table, or like examining the

Status of Evolutionary Faith

evidence for the roundness of a circle ! Each student of science, hearing evolution taught as unquestioned truth on all sides, naturally grew up an evolutionist, and if he became sufficiently interested in any branch of science to make a speciality of it, soon became so engrossed in his detailed investigations that he had no time or inclination to question the principle itself.

During the last two decades, however, a remarkable phenomenon has occurred. Gradually, item by item, the original Darwinian theory of the Origin of Species has been abandoned as a *cause* of evolution¹, and, as new discoveries in cytology and genetics became generally known, there occurred a subtle change in the teaching of the theory of evolution itself. While many scientists like Sir Arthur Keith still call themselves Darwinians, and still try to cling to the Darwinian theory², scientists as a group have abandoned Darwinism. Darwin's name, it is true, is still lauded, and his great service to science still praised by the majority of scientists. They believe in evolution as firmly as ever, but in place of the old confidence and assertiveness that natural selection was the sovereign explanation of all the problems connected with the origin of species, there is now only ambiguity of state-

¹ L. T. Moore : *Dogma of Evolution*, p. 22, 23.

² W. B. Scott : *Theory of Evolution*, p. 25.

Basis of Evolutionary Faith

ment and vagueness of thought, with increasing agnosticism as to the *causes* of the evolution which they all believe in. Even the old definitions of evolution are giving way to new ones like the following : “ Embryology further shows that evolution is not invariably an advance from lower and simpler to higher and more complex types, but may be by way of degeneration, and degradation.”¹ In contrast to Le Conte’s famous definition that “ Evolution is continuous *progressive* change, according to certain laws and by means of resident forces,”² the evolution of scientific opinion is striking, to say the least ! If evolution has come to mean going backward or downward as well as going forward or upward, then almost anyone to-day can be an evolutionist ! The Bible doctrine of the fall of man would be right in line with such “ evolution ” !

If embryologists have, as Professor Scott says, proved that evolution may be by way of *degeneration*, then, however much evolution may still remain as the fundamental principle of geology and biology, nothing could be plainer than that there needs to be a complete re-examination of the evidence for evolution itself ; for how can it any longer be claimed that all life has evolved from a single cell or group of cells by means of

¹ W. B. Scott : *Theory of Evolution*, p. 72.

² Le Conte : *Evolution and its Relation to Religious Thought*, p. 8. Italics mine.

Status of Evolutionary Faith

resident forces ? Why may not the alternative, and certainly more plausible, explanation that the forms of life in the world to-day represent a *degeneration from the originally created* forms of life, be accepted even by evolutionists themselves ? Evolutionists can still call that evolution if they desire, but if they define evolution as sometimes occurring “by way of degeneration” they have in reality accepted the logical possibility of special creation of the species originally !

Statements like the one quoted above from Professor Scott might lead the uninformed observer to think that perhaps the belief in evolution itself was disintegrating; but as a matter of fact the idea of evolution is still as firmly entrenched in the scientific mind as ever. It is only the *logic* of the belief that has been abandoned. Since the famous address at Toronto delivered by the late Professor Bateson a few years ago, which Professor Osborn deplored as likely to lead laymen in science astray, the majority of scientists have adopted the position which Professor Bateson then stated so frankly as that of *faith* in the *fact* of evolution having occurred, but ignorance or agnosticism as to the *causes* which have brought it about.¹ Vernon Kellogg voices what is probably the consensus of scientific opinion when he says : “ But—let me repeat—

¹ *Science*, N.S., Vol. LV, No. 1412, pp. 57, 61.

Basis of Evolutionary Faith

because the biologists do not know, or only partially know, the causes of evolution, to assume from this that they have any doubts at all of the reality of evolution would be to assume what is not true. I do not know of a single living biologist of high repute—and I do not determine repute on a required basis of belief in evolution ! —who does not believe in evolution as a proved part of scientific knowledge.”¹ From this it appears that we find science in the strange position of falling back on *faith in the dogma* of evolution, after all attempts to ravel the mystery of the causes which brought it about have ended in failure ! A careful examination of the various possible causes will clearly show just what a sheer venture of blind faith this is ; but the point to which we are calling attention now is that there is almost no division of opinion among scientists on two points : (1) that evolution is a fact, and (2) that no explanation of the causes which are alleged to have produced it has been, or can be, accepted by scientists of the present date. Darwinism is dead, Sir Arthur Keith and the Bishop of Birmingham to the contrary notwithstanding. It served the valuable (according to the evolutionists) purpose of convincing the scientific world of the fact of evolution, but now has to be abandoned as a theory of

¹ Kellogg : *Evolution, The Way of Man*, p. 95

Status of Evolutionary Faith

explanation of the causes of evolution. And though Darwinism is dead, alas, no other explanation has taken its place! Mendelism, mutations and what not, have all been examined, accepted in part or in total, and yet rejected as adequate explanations of the causes of evolution. Even the corpse of the theory of "acquired characters" was galvanized into an appearance of life by the late Professor Kammerer (who committed suicide when he discovered that someone had falsified the photograph plates of the salamander upon which he depended to prove that acquired characters were inherited) and Pavlov¹, only to be discarded as hopeless by most modern biologists. In short, all *possible* causes have been carefully investigated, and one by one abandoned as real explanations of evolution. Evolutionists conceal this fact even from themselves, and still cling to the delusion that some day, somehow, a cause adequate to have brought about evolution will be discovered. They seek to convey the impression that there are numerous possible causes of evolution which have not been thoroughly investigated, so that it is only a question of time and patient research before the definite causes of evolution will be discovered. What they are concealing, oftentimes even from themselves, is the fact that *all*

¹ Kellogg: *Evolution, The Way of Man*, p. 118.

Basis of Evolutionary Faith

possible causes of evolution have *already* been examined and one by one discarded. If evolution was not produced by any one of the possible causes now known to science, or by any combination of those causes, then *no* cause could have produced it, for there are simply *no other causes* to be investigated. Evolutionists still speak in the vaguest terms of the way in which water animals "acquired" the habit of spending part of their time on land between the tides, on some mud flat, until at last they "developed" lungs, as though all that was necessary to bring forth the lungs was the *need* for lungs ! Every biologist, except possibly the few who still cling to the delusion that acquired characteristics can be inherited, will admit that such statements have no basis in biological facts, and can only be asserted in blind, unreasoning faith. The mechanism of mutations and of Mendelian changes amply accounts for all inheritance factors, but there is no way in which a *new* characteristic, such as lungs, could ever enter the evolutionary chain except by special creation, which they deny. Any factor which is present as a gene on one of the chromosomes may lie dormant for some time, until by a "cross-over" (to adopt a convenient phrase) it is brought into the somatoplasm (i.e. the cells of the body, not the germ cells) and appears externally as a mutation, but unless

Status of Evolutionary Faith

present originally in the chromosomes, *there is no apparent way in which it can get in from without*. Mutations such as those above mentioned occur in a certain fixed ratio, in nature, and can be definitely calculated in advance, for the *Drosophila* for example, but these mutations are probably always produced by the *loss* of certain genes present in the ancestors (usually, if not always, through a "cross-over"), and probably never by the *addition* of new factors.

It has been claimed recently that this process can be speeded up by exposing the germ plasm to X-rays, so that the mutations which have to be waited for patiently in nature can be artificially produced by the effects of X-rays almost at will.¹ In announcing the discovery of this fact the statement was made that it was the process of evolution that was speeded up. This, of course, is directly opposite from the fact, for it is *devolution*, or degeneration that is speeded up, not *evolution*, if by evolution is meant progressive changes, with the production of new and more complex organisms.

The fact is, as has been stated above, that every possible cause has actually been examined and found wanting. Nothing now known to science could have produced evolution, and there is nothing left to examine. Yet strange to say,

¹ *Science*, N.S., Vol. LXVII, No. 1728, p. 146, Feb. 10, 1928.

Basis of Evolutionary Faith

instead of abandoning evolution, or re-examining the alleged evidence for evolution, scientists fall back on *faith* ! They say that they still *believe* in the fact of evolution, though they do not know what could have produced it !

Now to the outsider, this situation seems ridiculous. In fact, were the whole subject not so closely entwined with moral and religious implications, the scientific attitude toward evolution would be amusing. After so many scientists for so long a time have ridiculed as unscientific the Christian's faith in the Word of God as a divine revelation, and have spurned miracles as contrary to natural law, all because we believe that God can control nature and can intervene in nature whenever He desires, to find these same scientists depending upon *faith* to prove evolution is interesting, to say the least !

In any other phase of human activity, if all possible causes which might have produced a thing have been examined, investigated, and abandoned as explanations, were the thing in question an intangible theory, the evidence in its support would begin to be seriously examined and questioned. Why are not scientists doing the same thing in regard to evolution ? If there are no known causes which might have produced evolution, why is not the fact of evolution having

Status of Evolutionary Faith

occurred brought out into the light of day and given a careful re-examination ? To the outsider this would seem the natural and inevitable thing to be done, but it is not done by the scientists themselves. One is reminded of a banker whose funds and credit are exhausted, yet who keeps a bold front before the world, and becomes even more vociferous in proclaiming the solidity of the bank when that solidity is challenged by sceptics.

CHAPTER II

EVOLUTION AND SCIENTIFIC REPUTE

IN the last chapter we quoted Vernon Kellogg as saying that all biologists of high repute believe in evolution as a proved part of scientific knowledge. In this chapter we shall discuss two questions. First, what is the path to scientific standing or repute, and second, why scientists do not criticize the evidence for evolution.

In the first place, what is the pathway to recognition in scientific circles? Has that pathway any bearing on the belief of scientists in evolution? What we have to say concerns particularly biology and geology, though it is true more or less of all other sciences. At the outset we must call attention to the fact that the body of scientists is a more or less closed order. In saying this we do not mean that scientists are trying to keep other people out of their ranks, or that new men are not constantly entering the ranks of science. What is meant is that there is only a certain pathway to scientific standing, and that unless one travels along the

Evolution and Scientific Repute

fixed pathway it is almost impossible to gain recognition as a scientist. To gain recognition as a scientist, a man must in some way add to the sum total of human knowledge in the particular field of science in which he carries on his labours. This seems a perfectly fair requirement, and doubtless any man could gain scientific standing, regardless of where he laboured, or what his previous training was, were he to meet this requirement. The difficulty comes in the preliminary steps which a man must take before he is in a position to make scientific discoveries.

How may a man become a recognized investigator? There is the key to the whole problem of the attitude of scientific men toward evolution. No man can become a scientist in biological, geological, physical or chemical lines, without adequate technical training, and no man can become a recognized scientist without being in a position where he can conduct research work. The first point requires proper teachers, and the second point necessitates adequate financial backing to supply the laboratory, equipment and supplies, and the means of livelihood for the worker. Theoretically a man could get the proper training through his own efforts in reading books and conducting experiments, but practically almost all scientists must get their training in the schools and colleges, and, because of lack of

Basis of Evolutionary Faith

funds, conduct their experiments in the laboratories provided by the universities or various "Foundations" established for the purpose of research.

Now naturally no man can become an instructor in a college or university, or secure a position as research worker in the laboratories of some Foundation, without passing through the educational system of the colleges and universities, and receiving the endorsement of men in charge of the various departments. Now let me ask a frank question of scientists. What chance do they think a man who was not an evolutionist would have of securing a position as instructor or fellow in biology or geology in any reputable institution at the present time? Practically none! Before a man could secure the endorsement of men in charge of the various departments, he would have to do special work in some department and win the approval of the men directly over him by the quality of work done. In most colleges to-day even instructors must have done considerable post-graduate study before they can secure a position. Now any man who spent several years in studying biology or geology without becoming an evolutionist would be considered either "queer" or "dumb" by his teachers, and would never be recommended for the position

Evolution and Scientific Repute

of instructor or for a fellowship in those lines. Unless he concealed his anti-evolutionary views, an opponent of evolution would have almost no chance of ever getting into a position where he could do research work in biology or geology, and so would never have a chance to obtain recognition in scientific circles. In making this statement it is not charged that there is conscious discrimination against anti-evolutionists by the scientists in charge of the departments. Probably they are almost entirely unconscious of such discrimination, yet that does not make the discrimination any the less real.

Any scientist who reads these words will probably heatedly deny that he has ever consciously or unconsciously exercised such discrimination, and he would probably be right, for there would have been *no necessity for him to make such discrimination!* All students who progressed far enough in biology or geology to be in line for a fellowship or an instructorship would, under the kind of teaching they receive, be confirmed evolutionists ! The assumption of evolution is such an integral part of biology and geology that it is almost impossible to study the subject without unconsciously accepting the assumption itself. Almost every standard textbook on the subject assumes the truth of evolution on almost every page. Practically every teacher

Basis of Evolutionary Faith

is an evolutionist and teaches evolution as "a proved part of scientific knowledge."¹ Indeed the young student who studies under an evolutionary instructor has practically no chance of learning even that there are any arguments against evolution, unless by chance he reads an article against it in some religious magazine !

As a matter of fact, the average student takes evolution as a matter of course, and knows or cares very little about the subject. Everybody who is anybody in college accepts it, and that is enough for him. He pays little attention to it and does almost no thinking about it. If he specializes in the fields of biology or geology, he soon unconsciously realizes that evolution is the warp and woof of those subjects, and since everybody with whom he comes in contact believes in evolution, it is practically inevitable that he too should accept it as a proved fact. As a result of this preparation the students who study advanced scientific courses in college already believe in evolution without ever having investigated the subject for themselves, or without even realizing that there are arguments against evolution. Under such conditions the professor who denied that he had ever exercised any discrimination against anti-evolutionists in selecting candidates for fellowships or instructorships,

¹ Kellogg: *Evolution: The Way of Man*, p. 95

Evolution and Scientific Repute

or in endorsing applications for such positions, would be strictly telling the truth, for in all probability there would never have been any anti-evolutionists for him to discriminate against !

Everyone then who starts to do research work in biology or geology, probably already believes thoroughly in evolution, without having given special study to the subject. After such an unconscious believer in evolution is installed in his position as instructor or research worker in a scientific laboratory, what are the chances of his investigating evolution ? Very few. Biological investigations of the present day are so highly specialized that it is next to impossible for the average research worker to spend any time in studies outside his special field. A person has only to read a volume like that of E. B. Wilson on "The Cell," with its almost 1,200 pages, to see and appreciate the fact that such a research worker's time is taken up entirely with investigations so highly technical that the average man knows nothing at all about them. Thousands of enticing problems are waiting for his solution, and even one problem may take years of research work in an almost infinitesimal portion of the vast field of biology. If he makes a reputation in his chosen line of research, that means that he becomes even more specialized, so that he seldom gets a good look at the science as a whole

Basis of Evolutionary Faith

in relation to other sciences and ultimate truth. He accepts the evolutionary theory because it is traditional among other scientists who are as specialized as himself. He looks constantly at one small corner of the scientific leaf and never has the time to stand off and view the scientific forest !

In view of such a condition, the fact that the American Association for the Advancement of Science has voted with practical unanimity that it still believes in the fact of evolution by no means implies that all scientists have thoroughly investigated the evidence for evolution and become convinced of its truth after such careful study ; probably a very small percentage of the membership ever did that. It only means that scientific prejudice, early training, and the knowledge that evolution is the popular view among fellow scientists have produced a mental complex in the minds of most scientists which led them to declare publicly their belief in evolution. In view of the fact that evolution is so widely assumed by scientists, it signifies little that Prof. Kellogg does "not know of a single biologist of high repute who does not believe in evolution." A real biologist of high repute must be such a specialist in his subject that he has little time for studying the evidence for evolution, and must assume it as a working

Evolution and Scientific Repute

basis for his subject. He is forced to do just what the layman does—take the opinion of other scientists, who are in turn specialists like himself, and who must also form their own opinions about evolution from what others say about it.

One example will show why this is the case. In the study of cells, it is impossible for the cytologist of the present day to be a first-hand authority through personal experiment and personal observation through the microscope, in even a hundredth part of all the myriad lines of research work being carried on in regard to the cells of different plants and animals. He accepts the results of the investigations of others in cytology and goes ahead. Is it not perfectly clear that such a man will never be likely to investigate, for example, the evidence for evolution from geology? He has no time for it even if he had the inclination. He could not continue to be an authority in his own line if he spent his time in such by-paths. The pathway to scientific distinction is so difficult that the average scientist has no time to study evolution; and since it is a fundamental assumption in several sciences, it is practically impossible for him to avoid believing in it.

But if, as was shown in Chapter I, scientists admit that no causes of evolution have been isolated, why do some of them, at least, not

Basis of Evolutionary Faith

investigate the evidence for evolution anew? In answering this question, several things must be borne in mind. First, they do not see the need for such investigation. Most scientists believe in evolution, therefore why bother to investigate the evidence for it? They regard it as a waste of time. Second, the various lines of evolutionary proof are so intricate and detailed that no one man could have the time to examine at first-hand all the evidence. Scientists are busy men and feel that they cannot spare the time for such investigations. Third, if evolution were to be discarded, it would mean that several sciences would have to be rebuilt from the ground up, and most scientists shrink before such a stupendous task. If the result of their investigation should prove that the evidence against evolution was sufficient to warrant its abandonment, the greatest scientific revolution of a century would be necessitated, and few scientists would be courageous enough to undertake the task. This fact, more than any other one thing, perhaps, accounts for the bitterness of some scientists against the popular opponents of evolution, and for the outcry against the "persecution of science" by Christians, which many of them set up when evolution is attacked in religious magazines. They feel that evolution is such an integral part of many sciences that it

Evolution and Scientific Repute

could not be attacked without attacking the science itself.

In the fourth place the re-examination of the evidence for evolution by reputable men of science would be so extremely unpopular among fellow scientists that few scientists care to risk their reputations in such a thankless task. Moreover, even were he to do so, unless a man were to do the impossible and gain a reputation as a scholar in all the different sciences which concern evolution before he attempted to publish his findings on the subject of evolution, other scientists would discount his statements and claim that his opinion was of no value in any field except the one in which he had specialized personally. Few men feel called to scientific martyrdom in a cause which is not only unpopular but which they feel certain is lost in advance.

Then lastly, suppose one of these research workers should become convinced in his own mind that the evidence against evolution was sufficient to demand the abandonment of the theory. What chance would he have of getting his ideas published in an official scientific magazine? The pressure of scientific opinion on the subject of evolution is so enormous that any ordinary man of science who attempted to challenge the current belief in evolution would probably lose his professional standing by so

Basis of Evolutionary Faith

doing. Rare indeed would be the man who could withstand the professional ostracism that would result from his attack on evolution ! The treatment accorded Prof. More, Professor of Physics in Cincinnati University, after he delivered the Louis Clark Vanuxem Lectures in Princeton University, in 1925, on the subject, "The Dogma of Evolution," is an instructive example of what would happen to any biologist who left the fold of evolution publicly. The abuse heaped upon Prof. More for daring to criticize current beliefs on the subject of evolution would be small compared to what any noted biologist who dared to oppose the theory would receive.

An instructive example of what would happen to biologists in such circumstances occurred after the address of the late Prof. Bateson above quoted. Probably the only thing that saved Prof. Bateson from scientific ostracism in that case was the fact that he reaffirmed his belief in evolution as a *faith* while at the same time declaring that he was agnostic as to the causes of evolution. Even so, however, Prof. Osborn tried to discount the effects of Prof. Bateson's statements by saying that Prof. Bateson was outside the main current of evolutionary thought, because, forsooth, he was a geneticist of the first rank !

The torrent of abuse and vituperation heaped

Evolution and Scientific Repute

by scientists upon the head of Prof. George McCready Price, Professor of Geology at Emmanuel Missionary College, Berrien Springs, Michigan, in "Science," some time ago¹, is another instance of what happens in the scientific world to anti-evolutionists. Professor Price is denied standing in the scientific world as a geologist, because he dares to attack the hoary and venerable doctrine of "Successive Geological Ages," and dares to assert his belief in "Catastrophism" and a universal deluge. Little attempt is made to answer his arguments or to contradict his evidence except in a few minor and unimportant instances, and yet he is made the target of such a torrent of abuse that it is hard to understand how such a magazine as "Science" could publish the article. The principle which seems to govern scientific standing in scientific circles, in regard to evolution, is not how well a man has studied his subject, but how well he has studied and *agrees with* current evolutionary thought !

It is asserted by scientists to-day that there is a perfect freedom for the expression of new ideas among scientists. This seems to be true in regard to most subjects, especially in regard to such ideas as the theory of relativity, against which there is no antecedent prejudice, but it is

¹ *Science*, N.S., Vol. LXIII, No. 1625, pp. 195-201.

Basis of Evolutionary Faith

certainly not the case in regard to the theory of evolution. The scientist who dares question the universal dogma loses caste, and few men would have the courage to attack it. If they did, their ideas would not be given a respectful hearing in scientific magazines. The arguments of a layman, of course, are either ignored, or he is called a religious bigot or an ignoramus, and usually both. These are a few of the reasons why scientists are not to-day reconsidering the evidence which is alleged to prove evolution, and why practically all scientists believe in evolution as a proved fact of science. For the most part the task of criticizing the theory is falling to the laymen in science.

CHAPTER III

SCIENTIFIC IMMUNITY FROM CRITICISM

AT this point in our discussion we are faced with a serious difficulty. Scientists in general claim that only scientists have a right to criticize scientists. They implicitly or explicitly assume that no one can criticize either their evidence or arguments unless he is a scientist of recognised standing. They refuse to reply to the arguments or criticisms of a layman, or, as was the case when the late William Jennings Bryan attacked evolution, they make an *ad hominem* argument and descend to abuse of the person who attacks their position. If the man who attacks evolution happens to be a clergyman he is called a religious bigot, or an ignoramus. If he holds a position as a teacher of science, he is called a scientific charlatan and impostor. Few are the scientists who would so lower their professional dignity as to reply publicly to the arguments in an article or book written by a person who was not a professional scientist. They rightly feel that only a person who has examined the evidence for evolution

Basis of Evolutionary Faith

has a right to speak on the subject, but they at the same time assume that a person who does not believe in evolution has never examined the evidence, or at least that he has not examined enough of the evidence to make his opinion worth considering. The very fact that a person does not believe in evolution is to them proof positive that such a man is prejudiced or that he has never examined the evidence. It never seems to occur to them that it might be possible for an unprejudiced person to examine the evidence for evolution and remain unconvinced of its truth !

Before we can proceed to examine the evidence for evolution, we must settle this question of the asserted exemption from criticism by the laity of all scientific theories and evidence. Has a layman in science a right to have his criticisms of a theory like evolution listened to respectfully and given a fair answer ?

It must be admitted at the outset that the uneducated layman who has never studied the subject of evolution has no right to expect a serious answer to his attacks on evolution, though even in that case his arguments deserve consideration if they are logically prepared. Articles which are mere bombastic attacks on evolution without either evidence or reasoned arguments to offer against it, deserve to be ignored, and scientists are perfectly right in refusing to consider them

Scientific Immunity from Criticism

seriously. But if an otherwise uneducated layman were to study the literature on evolution in the standard books and articles on the subject, and then, grounding his statements on evidence derived from those or other sources, and basing his arguments on the fallacies in the arguments of the evolutionists, were to write an article or a book in criticism of the theory, why should not those arguments and proofs be treated seriously and replied to as carefully as they deserve, and as carefully and thoroughly as though they were written by a scientist ?

Of course scientific men do not treat them that way, but why should they not ? The minds of scientific men are of the same kind as the minds of the laity. The mere diploma from a technical school or doctor's degree from some university does not bestow a different kind of wisdom upon the recipient, nor does proficiency in the laboratory in the use of the microscope place the biologist above the laws of logic. Evidence or arguments based on facts can be weighed just as carefully by the layman as by the scientist, provided the layman has the same knowledge of the facts as the scientist. At least the layman can weigh arguments and evidence as carefully as a scientist who is not a specialist in that particular line. We may theoretically admit that a layman is not as competent as the

Basis of Evolutionary Faith

anthropologist to judge the evidence whereby Prof. Osborn can reconstruct the two lone teeth from a Nebraska quarry into the fearsome creature whom he called the "Hesperopithicus," which teeth are now declared to be those of an animal, but the layman is certainly as competent a judge of the evidence as any scientific man who has never personally studied the evidence whereby such fossils are reconstructed ! Moreover when the layman finds specialists reconstructing these alleged missing links in totally different ways, and when he finds specialists in any particular branch of science such as anthropology disagreeing over questions such as whether the few relics of the Java Ape-man, "pithecanthropus," are really man or ape, he is justified in evincing scepticism about such alleged evidence for evolution. When he detects fallacies in the reasoning processes of the evolutionist and points out the insufficiency of the evolutionary evidence he is not to be contemptuously dismissed as an ignoramus. His arguments and evidence deserve to be answered seriously if they can be answered, and when we find scientists keeping silence before such attacks, the suspicion cannot help but arise that the arguments cannot be answered.

But let us examine more closely this claim that only scientific men have a right to criticize scientific arguments. One of the latest kinds

Scientific Immunity from Criticism

of evidence for evolution is the so-called "Nuttall Blood Precipitin Tests," whereby the degree of relationship between man and the lower animals is said to be demonstrated. Prof. Scott says, "they come as near to giving a definite demonstration of the theory as we are likely to find."¹

Probably scientists would call a man who questioned the validity of these tests for proving evolution an ignoramus, and would ignore any argument he might make, yet what would actually be the case? Outside the comparatively few men who may have repeated the Nuttall Blood Tests, not one of the evolutionary "authorities" can know more on this subject than any layman who reads the publications of Nuttall and his associates. The layman who reads Nuttall's publications will be just as good a second-hand authority on the subject as any evolutionary scientist who merely reads the same books and articles! Moreover a layman who can point out fallacies in the Nuttall arguments and conclusions, deserves just as fair treatment from scientists as the evolutionary scientist who accepts them and overlooks the fallacies in the conclusions. Perhaps Prof. Scott has actually repeated these tests in the laboratory, but since he is a geologist we assume that he has not. If he has not

¹ W. B. Scott: *Theory of Evolution*, p. 81.

Basis of Evolutionary Faith

repeated those tests, why is he an authority whose word must be any more accepted than the opinion of a man like Professor Harold C. Morton, who has likewise read the Nuttall publications and believes that they are far from offering any positive proof of the truth of evolution?¹ Is it not a scientific fallacy of the worst kind to assume that Prof. Scott's opinion is in itself of far greater value than that of Dr. Morton? Since neither of these gentlemen is, in all probability, a first-hand authority on the subject, Prof. Scott is to be considered just as much a layman as Dr. Morton, and his opinion valued for as much or as little as that of the other gentleman.

But the same thing can be said of other lines. When Prof. Kellogg, who is a biologist and not a skilled field geologist, expresses an opinion about geological evidence,² that opinion is worth no more than the opinion of a layman who has read the same books on geology that Prof. Kellogg has. When Prof. Osborn, who is a geologist and anthropologist rather than a biologist, expresses an opinion about cytology,³ his opinion is not one whit more valuable than that of the layman who has read E. B. Wilson's monumental work on "The Cell." Since there are at

¹ Morton : *Bankruptcy of Evolution*, p. 191.

² Kellogg : *Evolution, The Way of Man*, e.g., p. 198.

³ Osborn : *Origin and Evolution of Life*, e.g., p. 142.

Scientific Immunity from Criticism

least seven principal lines of evidence for evolution, each one of which is a science in itself, the average scientist can only hope to be a first-hand authority in about one line. In all other lines of evidence he has to depend upon the investigations of others, about which he reads in their published reports. The layman who reads the same evidence as officially published by these various investigators themselves, would then be at least six-sevenths as good an authority as the scientist who was a specialist in only one line ! As far as opinions go, one man's opinion founded on reading the work of others would be just as valuable as another's.

But let us delve still deeper into this tradition of scientific aristocracy that says that the scientific theorist is above criticism by ordinary mortals. We have already shown that the position of the evolutionist in science who is not a first-hand authority in any line of research is not one whit better than that of the layman who reads the same evidence, and that the latter's arguments logically demand just as careful consideration as the former's.

What shall we say, however, in the case of the layman who dares to criticize the conclusions of the first-hand authority ? At first one is inclined to say that such a scientist is above such criticism, but let us consider the case a little

Basis of Evolutionary Faith

more closely. Suppose a leading authority in some branch of science publishes his conclusions and the results of his investigations in some subject such as genetics or embryology. We assume that every scientist is honest until he is proved to be otherwise. An honest scientist will set down fully and accurately the results of his experiments and investigations. Since the subjective element may too often enter unconsciously into even a scientist's work and experiments, there is a chance that he *may* be mistaken in what he thinks he sees, or has discovered, but if he *is* mistaken, that fact will be discovered sooner or later as others repeat his experiments and observations. But let us suppose that his discovery or observation is amply corroborated. Under such circumstances it is evident that no layman has a right to question the actuality of the facts discovered. When, however, this authority in science begins to draw inferences and make conclusions as to the *meaning* of the facts he has discovered, he leaves the realm where he has a right to claim supremacy, namely the realm of objective facts, and enters the subjective field where he should be willing to meet the layman on even terms. If he gave a full and accurate report of his investigations and discoveries, the layman has every right to examine them and reason about them, and his

Scientific Immunity from Criticism

conclusions may be as correct as those of the trained investigator.

The fact that a scientist is a master of the technique of scientific investigation does not make him *any the better a logician when it comes to drawing inferences from his discoveries*. The hundreds of discarded theories about the cell, for example, certainly show that even scientists are constantly mistaken in the conclusions and inferences which they draw from their investigations, and that the fact that they have the requisite skill to make them honoured and respected as scientific discoverers and investigators, does not make them infallible reasoners or guessers in the realm of theory ! The history of the discarded theories of science proves that scientists have been mistaken over and over again in their inferences and reasonings, and if so, why may not the layman who studies their reports and books be as able to point out the fallacies in their reasoning as a scientist ? We submit that the scientist has no right to claim superiority and exemption from criticism from the layman when it comes to an examination of the results of his reasoning. He is to be honoured and respected, and his opinion is to be deferred to as long as he treats of what he has actually *seen or discovered*, but when he begins to link up his discoveries with theories about the facts,

Basis of Evolutionary Faith

he should be willing to accept criticism even from a layman, and consider the layman's arguments, if the layman has read his reports of the discoveries, with as much respect as though they came from a brother scientist. If such criticism is valid, it should be accepted on the same terms as criticism coming from a fellow scientist.

In this connection we must call attention to another fact. The average scientist has usually had very little training in the science of logic, or in the science of evidence. The layman who has had a training in logic and the laws of evidence is thus in a far better position to criticize accurately the theories and reasoning of the scientist, than is the fellow scientist himself. When one reads some of the books on scientific subjects that have been published by scientists, one is led to believe that courses in logic and evidence should be required in every scientific school !

In conclusion one more fact must be noted. It is not always the man who is the closest to the facts who can perceive the inner meaning of the facts. Prejudice, professional pride, and zeal for a particular theory may lead a scientist innocently into an erroneous interpretation of the discoveries he has made. It is as true to-day as it was in the time of Cæsar, that " people are always ready to believe what they want to believe," and oftentimes

Scientific Immunity from Criticism

even scientists are led into error in this way. A layman who approaches the subject from another point of view, may sometimes be able to discover errors in the deductions of the scientist that have escaped his notice. The scientist who is investigating lines connected with evolution is prejudiced in favour of it, so that his eyes may be easily blinded to the facts. The mere fact that a layman may be prejudiced *against* evolution, will make him all the more quick to detect errors of reasoning or deficiencies of evidence in the evolutionist's arguments. The mere fact of *prejudice* against evolution does not necessarily disqualify him as a critic. His very prejudice itself may enable him to see facts the others have missed.

It has been necessary to dwell thus at length upon the question of scientific immunity from criticism, because scientists are constantly talking about "persecution of science," and "attacks on science," whenever a clergyman or other layman in science ventures to oppose evolution. In the following chapter we shall discuss the reasons for theological opposition to evolution.

CHAPTER IV

THE BASIS OF THEOLOGIANS' INTEREST IN EVOLUTION

IT is a matter of amazement, and too often a matter of resentment, to scientists that theologians should take any particular interest in the subject of evolution. The fact that a theologian should dare to oppose the teaching of evolution in schools or write books and articles in opposition to it, is so far beyond their comprehension that they dismiss the books and the articles with a shrug, and become indignant over what they call the "persecution" of science by religion or by religious "bigots" and "ignoramuses." Only in the case of a few open-minded and tolerant men like Sir Oliver Lodge,¹ is any comprehension shown of the fundamental reasons for the interest of theologians in evolution, and for their opposition to the teaching of the subject in the publicly supported institutions of learning.

It will probably do little good to call attention again to the fact that the opposition of theologians

¹ Sir Oliver Lodge : *Evolution and Creation*, p. 28.

Theologians' Interest in Evolution

is not to science or to scientific investigation and research, but to the proclamation of theories as truth which the theologian believes to be false, and which have such a fundamental relation to Christianity as the theory of evolution is believed to have. Nevertheless, even though it is again ignored, we must reiterate it. It is of course impossible to prove a universal negative, but it is safe to say that almost all the current opposition to evolution arises not from any lack of sympathy or admiration for the self-sacrificing labours of under-paid scientists who are earnestly searching out the truths God has hidden in nature, but rather from sincere doubt as to the validity of the evolutionists' evidence, and at the same time from a sincere belief that the theory of evolution is logically opposed to the doctrines of Christianity. The average writer who is opposed to evolution is not ignorant of the evidence upon which the evolutionists base their arguments. Certainly one would have to be blind and deaf and dumb to escape the deluge of books and articles that have been written in recent years by evolutionists. Probably most if not all of the writers against evolution have endeavoured fairly to study the subject, and weigh the evidence of the evolutionists. Many of them, it is true, began that study with a theological prejudice against evolution, but even such men have studied

Basis of Evolutionary Faith

the evolutionists' evidence, and were that evidence of compelling weight, would probably have lost their religious faith if they felt it was contradicted by facts.

A large number of the opponents of evolution have probably passed through an experience similar to that of the present writer. Educated in a college where "Christian" evolution was taught as the rational explanation of the facts of nature, he took his course in biology under a professor who believed that biology could not be taught without the assumption of evolution as a basis. As far as can be recalled only one student in that biology class remained unconvinced of the truth of evolution at the end of the course. Evolution was there assumed, rather than specifically taught, but the whole atmosphere of the classroom was such that without having examined in any detail the evidence for evolution, the students were drawn irresistibly into the maelstrom of evolutionary belief.

The belief in Christian evolution was retained by the present writer throughout a theological course and for a number of years thereafter, until at last a book against evolution was brought to his attention. The reading of that book awakened him to the knowledge that all the evidence was not on one side of the question as was previously supposed, but still he was un-

Theologians' Interest in Evolution

convinced of the falsity of the long cherished belief. It was felt that there must be a reply to the convincing arguments and evidence of the anti-evolutionist, so he began seriously to read the evolutionary literature in search of the evidence which he had been taught was so overwhelmingly in favour of evolution. Always the evidence seemed to be just around the corner, but remained elusive. Deeper study of the subject still failed to discover the conclusive evidence that was supposed to prove evolution definitely. Gradually the conviction dawned that there was no such conclusive evidence as was supposed, and that perhaps after all the anti-evolutionists were right. That conviction has become a certainty the more the evidence has been studied.

The principal value in the above personal experience is in showing that not all the opponents of evolution are prejudiced against the theory because of theological beliefs. When the present writer began seriously to study the subject, the prejudice was all in favour of evolution. It was only later that the bearing of evolution on the subject of theology began to dawn upon him.

But however interesting such a subject might be as a scientific hobby, theologians as a class would have little personal interest in the theory

Basis of Evolutionary Faith

of evolution were it not for the fact that they are convinced of its vital relation to Christianity. It is conceivable that they may be wrong in that belief, but the belief itself explains their widespread opposition to the theory.

A great many Christians believe that it is possible to reconcile Christian evolution with Christianity, and it is doubtless true that a certain emaciated type of evolution could be reconciled with the teaching of the Bible. For example, it might be plausibly claimed that the writer of the first chapter of Genesis uses the word "day" in the sense of "period," as is indeed quite possible, if not probable. It might be said that God created Adam independently of the rest of the living creatures, and that they were the product of evolution, controlled and guided by God. It might even be claimed that man's body was the product of evolution, while his soul was created by God, thus making human history a break in the evolutionary process, and in fact a reversal of that process after the fall of man.

All this seems very plausible, but the trouble is, almost *no real scientist believes or teaches that kind of evolution!* The kind of evolution they believe and teach is too often of a mechanistic type, and at the best is an evolution which, while it accepts a kind of theism, nevertheless discards Genesis as untrue, denies the fall of

Theologians' Interest in Evolution

man, and includes human history in the sweep of the evolutionary process. Usually the mind of man is considered to be the product of evolution, so that if the whole of human history is placed under the sway of evolution, there is no place for redemption. Sin, it is said, is only the remnant of animal traits that will be sloughed off in the course of future evolution, so of course there is no real guilt attached to it. It is unpleasant, and perhaps unfortunate, that it clings to humanity so persistently, but in time we will evolve above it, so there is nothing to become particularly disturbed about. Our task is to assist in the evolutionary process, and struggle to eliminate as much sin as possible, but our heredity is responsible for the presence of sin, so of course there is no need of Christ as a Redeemer who died on the Cross as our Substitute, bearing the penalty for our sins which was due from us. "Let us help God finish the world!" is the cry theologians who believe in this kind of evolution are fond of uttering.

It is useless to claim that such an evolution is in harmony with the Bible or with historic Christianity, and yet *it* is the evolution that is usually believed in by those who claim that there is no conflict between evolution and religion "rightly interpreted." When scientists to-day endeavour to lull the fears of Christians by telling them

Basis of Evolutionary Faith

that evolution is in harmony with Christianity, they really mean that evolution is in harmony with a kind of Christianity that eliminates the first chapters of Genesis, does away with the fall of man and rules out miracles and a divine Saviour. Liberals of course have no difficulty in accepting this. Dr. Barnes, the Bishop of Birmingham, preaching in Westminster Abbey, is quoted in a London paper as saying, "Stories of the garden of Eden have become for us only folklore. Darwin's triumph has destroyed the whole theological scheme. Man is not a being who has fallen from an ideal state of perfect innocence. He is an animal who is slowly gaining spiritual understanding, and, with the gain, rising above his distant ancestors." Needless to say, though that kind of religion can be harmonized perfectly with evolution, it is not historic Christianity. It seems perfectly plain that the kind of evolution now being advocated by practically all scientists and teachers of science throughout the world is a kind of evolution that is directly opposed to historic Christianity at its vital point, namely, in the need of a Divine Saviour from sin. It is the realization of this fact that has caused the widespread interest among conservative Christians in evolution. It is the realization of this fact that is back of the agitation for the elimination of the teaching of

Theologians' Interest in Evolution

the theory of evolution as a proved fact of science in institutions supported by public funds.

There are probably many sincere Christians who accept the whole Bible and believe that it can be harmonized with evolution. We would not question the sincerity of their belief, nor would we question the theoretical possibility of harmonizing the Bible with an emasculated type of evolution which took humanity out of the scope of the evolutionary process, and regarded the mind of man as created by God. However, as has been said above, such an evolution is not the kind of evolution that is being widely taught to-day. Those who think it is are simply not familiar with the facts. While here and there a teacher of science may be found who teaches such a theory because he is too good a Christian to discard his Bible, the vast majority of evolutionists either eliminate those portions of Christianity which are out of harmony with the theory, or discard Christianity altogether.

The kind of evolution that is being taught and advocated by the majority of scientists to-day is one that, while it may tolerate a theoretical God looking on at a distance in the universe but never interfering in the chain of life and events, nevertheless carries on all its investigations as though such a God were non-existent, and seeks to explain even the spiritual nature of man,

Basis of Evolutionary Faith

as well as life itself, as the product of mechanical evolution. When a reputable text-book on biology, published in 1925 by a professor in the College of New York, states "that protoplasm arose spontaneously long ago is good speculation,"¹ we cannot be deceived about the theological bearings of the evolutionary theory held by such men. When a writer like G. Elliott Smith, of the University College, London, in the course of a chapter which has as its purpose the proving that man's mind and brain are identical and that both are the product of evolution from the lower forms of life, states : "In the evolution of Man the attainment of increasingly skilled movement involved the growth of mind"² and when he assumes that the physical brain constitutes all that there is to man's mind, and further says : "The human cerebral cortex provides the vital mechanism that can be fashioned by education to initiate and control an almost endless variety and complexity of muscular actions,"³ there remains little doubt in our minds that the modern theory of evolution in all its ramifications has essentially undermined belief in God, the soul and immortality, to say nothing of rejecting the Bible as the Word of God ; and when we find that this is being taught in our

¹ G. G. Scott : *Science of Biology*, p. 389.

² G. Elliott Smith : *Essays on the Evolution of Man*, p. 137.

³ G. Elliott Smith : *Essays on the Evolution of Man*, p. 136.

Theologians' Interest in Evolution

schools and colleges as scientific fact, the theologian can no longer remain indifferent. When Sir Arthur Keith, the anthropologist and leading Darwinian of to-day, contributes, as happened recently, the leading article in the atheistic magazine which is the official organ of the Rationalist Press Association of Great Britain, one's doubt of the theological affiliations of evolution is removed.

If the theory of evolution as it is being taught to-day by these leading evolutionists is *true*, religion and morality and ethics might as well be cast on the scrap-heap, for the soul-less body of the animal man is no longer to be concerned with the fiction of life after death. The fact that atheistic societies of "Damned Souls," and the "Circle of the Godless," are being organized in many of the leading universities of America, is very significant when we realize the implications of evolution as it is taught in those universities to-day.

The fact, then, that evolutionists have stepped into the realm of religion, and claim that their theory overturns most that is there taught as true, accounts for the concern which theologians feel about evolution. The kind of evolution that is being taught in most schools and colleges, with perhaps a few notable exceptions, is not only anti-Biblical and anti-Christian, but is

Basis of Evolutionary Faith

anti-theistic ! What authoritative text-book or monograph on evolution, anthropology, or biology can be pointed out by evolutionists as a book that does not either implicitly or explicitly teach that man's mental nature as well as his body is the product of evolution ? And what text-book on evolutionary biology is there that specifically teaches that a personal God who created matter and life exists ? Most books on these subjects dodge the issue and say that it is not the province of biology to discuss the subject, but the assumption is that mechanism accounts for the whole process from matter to man, and teleology is usually expressly denied in the whole process.

Under such conditions it is pure ignorance to assert that evolution as it is taught to-day has no bearing on religion ! If evolution of this type is true, theologians might as well shut up shop at once. The question of the validity of such a theory is vital to the existence of Christianity itself, and theologians who are blind to its significance are living in a fool's paradise.

Is it any wonder, then, that theologians who are mere laymen in science feel driven to the investigation of evolution ? The theory as taught above may be true, but if it is, Christianity in the historical sense is an anachronism. Whatever prejudice theologians have against evolution is

Theologians' Interest in Evolution

due to the fact that they have independent proof that the Bible and Christianity are true, so they feel that a theory which denies the truth of both is false and should be rejected. The stronger their Christian conviction of the truth of the Bible and Christianity is, the deeper will be their aversion to evolution, yet in the examination of evolution the theologian wishes to be entirely fair in his examination of the evidence. We, as much as the pure scientist, desire only the truth. It will take strong evidence to convince us that a theory with such religious, moral and ethical implications is true, but we ask neither fear nor favour from science, and only desire fairness and honesty in the face of the evidence. In opposing evolution we are not opposing science as such, but only false science. We are not the enemies of scientific research or of the scientific spirit, but wish such research to be confined to the realm of objective fact.

We have, it is true, certain presuppositions. We believe that God exists and that He has given, in the Scriptures of the Old and New Testaments, a revelation to man, and we feel sure that no scientific theory will be proven true which contradicts the Bible; but the fact that we have these assumptions is not an argument against our intellectual honesty. The thorough-going evolutionist has his assumptions too,

Basis of Evolutionary Faith

especially the presupposition that God has never interposed in the stream of natural law, so the evolutionist cannot logically refuse to consider our evidence and arguments on the ground of our having these assumptions. A man may have assumptions and yet be fair in his examination of evidence and arguments. His very prejudice may enable him to see flaws in the evidence that would escape the advocate of the theory.

CHAPTER V

THE ORIGIN AND NATURE OF LIFE¹

HAVING justified the right of a layman to examine a scientific subject such as evolution, and to criticize the arguments and inferences of scientists, we are now in a position to grapple with the theory itself. In the preceding chapter the anti-theistic attitude of most evolutionists was pointed out, and attention was called to the tacit assumption that is often made that the whole process of evolution can be explained according to inherent laws with God left out. One may almost say that the whole original purpose of evolutionists was to account for the universe without the necessity of postulating God as its cause. We would not be understood as saying that this is the purpose of evolutionists to-day ; present day evolutionists have found evolution a convenient theory by which to explain the phenomena of nature. The popularity

¹ Much of the material contained in the following chapters was published in an article by the present author, in the *Princeton Theological Review*, July, 1926. Credit is hereby given to this magazine. The facts in these chapters have been revised up-to-date, and much new material added.

Basis of Evolutionary Faith

and persistence of the theory to-day, however, can be better understood if we remember that the modern theory was called into existence in order to escape the conclusion that God was the creator of the universe. Practically all atheists to-day are ardent advocates of evolution as the ultimate explanation of the universe. If the myriad forms of life could be explained as the product of chance variations which rendered the individual able to survive in the struggle for existence, and eventually produced a new species, then there was every probability that the original undifferentiated protoplasm likewise originated from lifeless matter, by some chance combination of the proper molecules, and perhaps, even, that matter itself so originated. Thus God could be dethroned, and dismissed from the universe as an unnecessary hypothesis.

Whatever may be said about the theory of evolution, however, the day is past when scientists can ignore the question of the origin and nature of life. The conclusion seems inescapable that we must postulate a planning, thinking God who created the first life, for it can no longer be claimed that there is such a thing as undifferentiated protoplasm which is merely a chance grouping of atoms and molecules. The compound microscope has opened up a whole world of marvels inside the cells themselves, and has

Origin and Nature of Life

shown that the cell is a microcosm, a world of order in itself. It is just as illogical to suppose that the cell could have originated by a chance combination of molecules as to suppose that a house could grow from piles of sand, brick, cement, iron and wood without the help of the mind of the builder. But if we must assume the existence of God as the creator of at least the first life ; if life cannot develop from lifeless matter without the help of a personal God, then the whole *raison d' être* of the original theory of evolution disappears, for that purpose was to explain the universe without positing God.

The question of the origin of life is indeed unsolvable to evolutionists to-day. The majority of them cannot of course admit that God created it, for that would bring in supernaturalism, and make it impossible to deny the possibility that God went still further in the creation process, perhaps even creating the species themselves. Yet with God ruled out, there is no known way by which life could come into existence, *de novo* in a lifeless world. As a result of this dilemma, most evolutionists take the position of agnosticism, and say that they do not know what produced life, and that that question is outside of their province.

A few biologists continue to attempt to combine elements so as to produce protoplasm which

Basis of Evolutionary Faith

will become alive, but are meeting with no success. One of the most absurd theories advanced was that life came to this earth from another planet on a meteor ; but that of course simply pushes the problem off into space and back into time a little farther, without in any way solving the problem. Such a theory, at any rate, removes the question of the source of life to a realm beyond the possibility of scientific investigation, and renders agnosticism a permanent possibility. The frictional heat generated in any meteor which strikes our atmosphere is so great that it would be thoroughly sterilized before reaching this earth ; but suppose the theory were true—what then ? It would remain just as much a problem to account for the origin of life on the distant planet or star, as it is in this earth, and any theory which is thorough-going should account for the ultimate origin of life.

A large number of biological experimenters and investigators believe that the ultimate solution of the problem of life will be in the terms of physics and chemistry, and so the science of biochemistry has been developed since the beginning of the twentieth century to study all the physical and chemical processes involved in life. Many marvellous discoveries have been made of the constitution and action of the complex molecules of the various proteins in assimilation and

Origin and Nature of Life

respiration in the living organism, as well as discoveries of new substances such as vitamins, oxidising enzymes, hormones, etc., whose nature and action have as yet been only imperfectly studied in their relation to the life processes. It is freely admitted by biochemists that these life processes are as yet imperfectly known, but it is claimed by them that sufficient has been discovered to warrant the claim that in time they will all be analysed, and that all the life processes will be completely explained in terms of physics and chemistry.¹

One may be pardoned a slight scepticism before such bold claims, and express a doubt as to whether these vital processes will ever be as completely analysed or explained as these biochemists would have us believe will be done, though one cannot help feeling that they may be right in asserting that chemical action and mechanism account for a vast amount of what takes place in the living cell, when one reads of the experiments which have been made along these lines. For example it is now thought that the growth which follows the fertilization of an egg by a sperm, at least in some cases, is produced by the mechanical effect of the sperm piercing the egg, for frog eggs have grown to

¹ *Encyclopædia Britannica*, Thirteenth Edition (1926), *Biochemistry*, Vol. I, p. 376.

Basis of Evolutionary Faith

adult frogs without being fertilized by sperms, when the egg has been pierced by the point of a needle ! It has likewise been proved that two "white flowers from different plants of the same species may lack colour because one component of the colour-producing system is absent. . . . If their deficiencies are complementary, a proportion of the seeds produced on cross fertilization will yield plants with coloured flowers !"¹

All this is indeed startling and suggestive, and as E. B. Wilson² says, "mechanistic interpretations of vital phenomena . . . are a 'necessary fiction,' " in order to further biological research. With such encouraging discoveries already made, biochemists are indeed justified in proceeding with their investigations as though all the myriad problems connected with the living cell could be solved by the microscope and test tube. Undoubtedly many of them will be, though, as was said above, it is to be doubted whether all of them will finally yield to the researches of scientists. Biochemists, however, with the enthusiasm of devotees for a youthful science, are in danger of losing sight of a very important fact. Suppose there should come a time when biochemistry could explain *all* the mysteries connected with cell structure and

¹ *Encyclopædia Britannica*, *op. cit.*

² *Op. cit.* E. B. Wilson: *The Cell*, p. 1117.

Origin and Nature of Life

activity. Suppose, even, the time should come when the biochemist in the laboratory could manufacture protoplasm that would behave as ordinary living protoplasm behaves, being able to conduct the process of (1) assimilation and respiration, (2) reproduction, (3) growth and development, (4) movement, and (5) secretion and excretion. Would that mean that the mystery of the origin of life was at last solved according to the laws of physics and chemistry? Far from it. It must never be forgotten that all this would be brought about by a thinking mind in the man who manufactured it, and that the same processes could never take place by chance, and unassisted, in a universe of matter where there was no directing, planning mind in control! Suppose we could manufacture life. That would only show that the mind of God which first produced living cells ages ago, used materials and laws which a human being can use to-day, and it would be almost conclusive proof that the cell could not originate itself without the power and planning of a thinking mind!

Then, too, the biochemist must not forget that when the problems of the composition, structure and functions of the living cell are finally solved, infinitely more complex problems will then demand solution. How did the living cell first co-operate with other living cells to

Basis of Evolutionary Faith

produce the many-celled organism? How do the cells divide and subdivide into an almost unlimited number of other cells, large numbers of which have different functions, while at the same time they remain in one inter-related and interacting system as in the higher organisms and in man? The mere mention of such questions gives us a little glimpse into the maze of complex problems that would await solution even after the problems of the simple cell are solved. In fact the more one studies these problems, the more amazed one becomes at the wonders of life.

Though physical and chemical processes are doubtless the mechanical means by which the vital processes are carried on, it is simply inconceivable that these vital processes were originated by the chance action of such forces. Nor is it conceivable that there is no mind back of these activities, though admittedly this is more difficult to prove to opponents who constantly take refuge behind the term "evolution," and who depend upon the fact that life is with us and in actual operation, while the underlying, directing mind is intangible and non-material in its essence and operation.

Geneticists tell us to-day that all the complex characteristics which go to make up an individual are produced by what are called "genes," ultramicroscopic somethings, located serially

Origin and Nature of Life

on the chromosomes in the germ cells. In the higher organisms there are probably thousands of these invisible genes. When the gene for a particular characteristic is absent from the chromosomes, that characteristic disappears from the individual. Suppose biochemists should be able to manufacture protoplasm which had the characteristics of living protoplasm; can anyone imagine for a moment that they could manufacture the genes that produce all the characteristics of all the individual organisms in the world and locate them in the proper place along the chromosomes? Remember that these genes are ultramicroscopic, and that there are thousands and perhaps millions in their proper places along the chromosomes! It is simply inconceivable that such things could be manufactured in the laboratory, and it is likewise inconceivable that they could happen by chance. There must be a mind directing and guiding and controlling this whole intricate process, for as Wilson in the above quoted passage¹ says, "mechanistic interpretations of vital phenomena . . . are a 'necessary fiction'" in order to further biological research, but nevertheless they "are inadequate" as a complete explanation of such phenomena.

Other biologists, following the example of

¹ E. B. Wilson : *The Cell*, p. 1117.

Basis of Evolutionary Faith

Driesch,¹ place a vitalistic interpretation upon the phenomena of life, and though many of them reject the strange "entelechy," or "psychoid" of Driesch (this entelechy seems to be a sort of *tertium quid*, neither mind nor matter, which Driesch postulated as the cause of life and vital phenomena) nevertheless many of them hold that in life there is both an unknown and unknowable (at least by the microscope and test tube) force of some sort at work that is of a different quality from physical and chemical forces, and that is beyond the reach of biological investigation.

It is probably true of such a view, as Wilson² says, that it "involves a practical abandonment of the problem" and would produce a deadening influence upon biological research were it generally accepted. Nevertheless, these vitalists seem nearer the truth than Joseph Needham, who criticizes their view³ rather acutely, but seems to miss the point of J. Arthur Thomson's illustration about the breeding and spawning journeys of the eel as proving that there is more to the eel than "chemical explosions of reserve material in the muscles of the eel's tail."⁴ Thomp-

¹ Driesch : *Philosophy and Science of the Organism*,

² E. B. Wilson : *The Cell*, p. 1116.

³ Needham : "The Philosophical Basis of Biochemistry," in *The Monist*, Jan., 1925.

⁴ Thomson : "Is There One Science of Nature?" in the *Hibbert Journal*, Oct., 1911.

Origin and Nature of Life

son is not advocating intelligence on the part of the eel in a "mystical sense," as Needham assumes,¹ but is showing that the whole mysterious journey of the young eel which has never visited the ocean, yet goes unerringly from the rivers and brooks of North America directly to the ancestral spawning place in the middle of the Atlantic Ocean, cannot be accounted for on the theory that physical and chemical processes alone are adequate to explain its life phenomena. Needham is probably right in saying that it does not help us to assume an "entelechy" as the cause of this, for the problem immediately arises, what is an entelechy?—and this is beyond the reach of laboratory experiment and observation.

In dealing with this problem of seemingly inexplicable teleology in the lower animals such as the eel, both vitalists and mechanists seem to ignore the possibility that there may be another and even more plausible interpretation of such phenomena, namely the possibility that they are due to the *direct manifestation of God's power and guidance*! There are probably three reasons, at least, why this possibility is ignored. In the first place, it savours too much of pantheism to suit most of these workers in physical and chemical materials, and a man of science is

¹ Needham: *op. cit.*, p. 37.

Basis of Evolutionary Faith

almost invariably either dualistic or materialistic in his philosophical assumptions. In the second place, the scientist can never see how a phenomenon which is so amenable to the control of man as the mechanism of cell growth and division, and which is at the same time seemingly so completely under the control of definite laws, can ever be a direct manifestation of the power of the Infinite God. In the third place, there is the innate tendency of all modern science to rule God or anything that smacks of the supernatural out of the laboratory. It would be "bad form" for a scientist to express the opinion (even though he had it) that God had anything directly to do with these vital processes !

Yet is this alternative explanation so preposterous after all ? The fear in some minds that it is pantheistic can be dismissed at once, for the essence of pantheism is that God does not exist outside of nature, while the view here advocated is that God is both transcendent of, and imminent in these vital processes. The marvellous experiments¹ on the life in plants conducted by Sir Jagadis Bose, the Indian scientist, with the aid of the exceedingly delicate instruments such as the "Resonant Cardiograph," which he has invented, show conclusively that even plants are extremely sensitive organisms, though it seems

¹ Cf. *Literary Digest*, July 7th, 1928, p. 23.

Origin and Nature of Life

to me these experiments in no way justify the pantheistic conclusions of Sir Jagadis Bose, for the shocking to death of a plant like the mimosa by a high-voltage electric current points, not to unity of the living and the not-living, as pantheists postulate, but to the fundamental difference between a living plant or animal and lifeless matter. When the mimosa died in a death struggle so vividly magnified and portrayed on the screen by Sir Jagadis Bose's invention, it was quite evidently different after death from what it had been an instant before.

It is simply impossible to believe, in the face of such evidence, that the mechanistic interpretation of life is correct. But it is equally impossible to believe with the pantheists that there is no difference in kind between plant and animal life and matter itself. Did the vitalists' interpretation not have so many other weighty objections to it, it might be accepted as an explanation of such phenomena as Sir Jagadis has brought to our attention, but the postulate that God's power is directly manifest in life phenomena accounts for those puzzling phenomena as well as the vitalists' *tertium quid*, and does not have the objections which bear against the vitalists' theory. At any rate by placing God *outside* (if we may be allowed to use a spatial term about God merely by way of a figure of speech) as well as *inside* the

Basis of Evolutionary Faith

life processes, the charge of pantheism is sufficiently answered.

The objection to the view that God is directly responsible for life phenomena, on the ground that the supernatural must be ruled out of the laboratory, is simply an irrational prejudice against supernaturalism, and can be dismissed at once if the arguments for the existence of a personal God are valid. The only serious problem connected with the supernatural view here suggested, lies in the objection that cell life phenomena can be controlled experimentally by man, and seem to be completely under the control of physical and chemical forces. These facts at first sight seem to make the mechanistic interpretation very plausible. It is a specious plausibility, however, which arises from a lack of appreciation of the nature and all-comprehensiveness of God's power. The moment one mentions God, the average materialistic scientist thinks of an irrational miracle happening contrary to natural law, and because he is certain such irrational events are not now happening in the laboratory, he jumps to the conclusion that God cannot have anything to do with it.

Now of course no Christian who is intelligently informed believes that miracles happen in an irrational manner, but he believes that they are just as much a part of God's plan and purpose

Origin and Nature of Life

as all other events. They are simply a departure from the ordinary way in which God acts, in order to accomplish a definite end which is a part of God's eternal purpose. The kind of supernatural activity we are now advocating, however, is not concerned with miracles at all, and in fact, to speak exactly, this activity is not *supernatural* at all, but *natural*, that is, it is the way God *ordinarily* acts. It is this ordinary activity of God that the materialistic scientist is unable to grasp. He seems utterly unable to understand the idea that God can *directly manifest His power in the rational laws* of nature, and that those laws are merely the uniform way in which the rational God acts. The reason they are uniform is because they are subject to the rational side of God's nature, so that God does not have to change His mind, for that uniformity itself is due to the immutable purpose of the Almighty, who sees and plans the end from the beginning. It makes them no less dependable for the scientist, to say that they are the manifestation of God's power, for God does not act upon caprice as the materialistic biologist assumes when we say that God is back of these vital phenomena. There is, then, no point to the objection to the view that the vital phenomena are the direct manifestation of the power and energy of God, on the ground that the vital phenomena are amenable

Basis of Evolutionary Faith

to law and can be controlled by man to a certain extent, for this would be true while at the same time God was acting in them.

The difficulty can be cleared up at once if we get the distinction between the activity of God in a natural, and in a supernatural way. When God interrupts or transcends the uniformity of nature for a definite purpose, to perform a miracle, we call that the *supernatural* activity of God ; but the ordinary uniformity of nature is just as truly God's activity as is the other. The only difference is that God then acts according to what we call the laws of nature, which are the ordinary, constant, and so called *natural* ways in which He manifests His power and activity. This power seems to appear more directly and vividly in life and the vital phenomena connected with the cell, than in matter and in physical and chemical laws, though it is God's power manifesting itself just as much in one as in the other. This power appears in *every* part of nature, and there is nothing in nature, except the permissive activity of free spirits, that is independent or even relatively independent of God's power and purpose. It is because the purpose and plan of God are immutable that the biologist is justified in assuming that his microscope can discover more and more of the hidden secrets of the life processes. The mechanis-

Origin and Nature of Life

tic biologist, however, errs radically if he assumes that when he discovers the laws under which the vital processes operate he has explained and accounted for life itself, for that life, though amenable to law, is not comprehended *in* the law, any more than the physical and chemical power which manifests itself according to law, is comprehended *in* those laws. The vital power, even could it be reduced to physical and chemical power, would still demand a rational source in a personal God, just as physical and chemical power demands a source in a thinking, personal, omnipotent God.

The energy and power which are manifesting themselves in the phenomena connected with life, however, seem to be a different expression of God's power than the expression of power in lifeless matter, according to what we call physical and chemical laws. The vitalist seems to be right in pointing out the inability of the mechanist to account ultimately for that something in life that makes it *life*. There seems to be, beyond a doubt, a potency connected with life that differentiates living protoplasm from inorganic matter. When the cell dies, the same inorganic materials are present in the cell that were present a moment before, but a change has taken place, and this change is *more* than a chemical change which probably accompanies death. The vitalist,

Basis of Evolutionary Faith

however, does not improve matters when he assumes a *tertium quid*, a theoretical "entelechy," as the explanation of this change or difference between living and not living matter. An explanation that avoids the difficulties besetting both the mechanistic and vitalistic views, is the one we have here advocated, namely the vital phenomena, just as physical or chemical laws are the direct manifestation of the *power and energy of a thinking, personal God*, according to the self-constituted rule or law by which the life phenomena occur. The clear demarcation between living and non-living matter would be due to the fact that God expresses His activity according to a different rule, in life phenomena, from the way He expresses it in not living matter and energy, while the fundamental similarities pointed out by mechanists, between not living and living matter would be due to the fact that both are the expression of the same God's power and activity.

The advantage of this view is that it explains and harmonizes a great many difficult problems connected with life and cell constitution. Take for example the instance cited by J. Arthur Thomson, of the eel and its migration to the ancestral breeding place. It cannot be explained by habit, for the eel goes to the ancestral spawning place for the *first* time. It cannot be explained

Origin and Nature of Life

as due to independent thought processes in the mind of the eel, for no one would hold that these processes are sufficiently developed to guide it on this long journey without the aid of memory. It cannot be due to parental training, for the parents are not associated with the eel and therefore can have no part in the process of guiding it to the ancestral spawning place. We may call it instinct ; but is not that merely a term to cover up our ignorance of what makes it go unerringly to that particular part of the ocean ? Least of all can we account for this strange migration by physical and chemical processes that enable it to make the journey. A theoretical "entelechy" in life itself, since it would be incapable of thought and purpose, helps us not at all to solve the problem. In fact the only logical explanation is to say that the eel is directed and controlled on its journey by a thinking, rational, all-seeing God !! Not, of course, in any miraculous way, involving an interruption or suspension of the laws of nature, but in the simple, ordinary, *natural* activity of God in vital phenomena. Such an explanation is one big enough to fit the facts, and no other explanation will fit the facts. Of course, it would be "unscientific" (!) for a scientist to advocate such an explanation, but should not naturalistic prejudice be discarded long enough

Basis of Evolutionary Faith

to endeavour to comprehend facts which cannot be measured by the mechanistic yard-stick?

Or consider, for a moment, the whole mysterious process of cell growth and division. It is filled with what is apparently purposive action, and yet we know that there can be no purpose in the brainless and soulless cell. We cannot take the time to describe this marvellous process of cell-division that biologists have observed through the microscope,¹ but we must call attention to the fact that the polar arrangement of the chromosomes, and the complex processes that precede cell-division all seem clearly to indicate purposive control and orderly, guided activity. If it is recognized that the mind of God is back of the process, it is all clear and understandable in an instant; but if we try to account for it on the supposition that mind and purpose are lacking, infinite difficulties emerge.

What, for example, would be the answer to the following questions, if we say that mind and purpose are absent in cell life? Where does the cell get and what teaches it to use its power of assimilation and growth? It may be replied that it is the innate *life urge*, present in all living

¹ Cf. Wilson: *The Cell*, pp. 114 ff. A good, simple, non-technical description of the process of cell-division is given in Jones: *Genetics*, pp. 88 ff., and in Crew: *Animal Genetics*, Chap. III, though all this material is given in a more complete form in the monumental work of Wilson here cited.

Origin and Nature of Life

cells ; but what constitutes that life urge ? What shapes the sperm cell and prepares it for motility so that it can reach and fertilize the egg ? What guides the whole process of growth in the organism so that a given cell always develops into a particular kind of organism, and in the process produces all the multiplex parts of the individual organism, with its specific organs specialized in disparate ways ? Cytologists¹ tell us that every single one of the multitudinous qualities of an individual is produced by fixed "genes," located serially on each of the chromosomes of the germ cell ; that the exact location on the different chromosomes of all the different genes that produce these qualities can be determined definitely in insects such as the *Drosophila*, and that in all probability the same conditions hold for all plants and animals, including man. The moment any gene is omitted from an individual's germ cell, a corresponding change or mutation occurs in the new life that is born, thus proving that all the various parts of the organism depend upon specific genes attached to, or part of the individual chromosomes in the cells, or upon the united activity of all the genes taken together.

This is all very marvellous, but it must not be forgotten for a moment that when the cytologist

¹ *Bibliographica Genetica*, p. 92 ff.

Basis of Evolutionary Faith

and geneticist describe the mechanism of inheritance, they have not shown what really causes the thing ! What gives the gene its particular quality ? What is the origin of the gene ? What gives it the power of fashioning the particular characteristic in the individual ? Suppose we were to grant what most cytologists probably believe, namely, that a gene is a molecule or a particular arrangement of molecules of matter ; we would be no nearer the solution of the problem, for the crucial questions would remain : (1) What gives the molecule the marvellous faculty of directive activity in producing the given characteristic of the organism ? and (2) How could a mindless molecule or group of molecules shape other molecules into a pattern not in the least resembling their own constitution ? Is it not plain that all we have done or can do is to push the problem back a little farther without arriving at any real solution ? It all shows the effects of purpose, and purpose demands a mind back of it, so that the only solution that really solves the problem is that, ultimately, the energy of life is a *manifestation of the purposive activity of God !*

A natural objection to this view arises at this point. Why is it man can change and interrupt these vital processes, even destroying life itself, or causing a different combination of genes and

Origin and Nature of Life

chromosomes, if life is the manifestation of the purposive activity of God? Before attempting to answer this question, we would point out that this question should not be raised with regard to life alone; it can be raised with equal validity in regard to lifeless matter, for man can change and interrupt the combinations of molecules and atoms in lifeless matter as well. In fact the fundamental question involved is this: how can man co-operate with God or apparently control to a limited extent the operation of natural laws? This undoubtedly is one of the most important problems of theism, and with the limitations of human knowledge probably cannot be completely solved. We know that such control *can* be exercised by man over matter as well as life, whether we can explain it or not, and we know that all the plan, design and purpose manifested in nature indicate the existence of a personal God. All we can say is that for His own inscrutable ends He has placed such powers in man's hands. The only difference between life and lifeless matter in that respect, is that in life there seems to be a more *direct* manifestation of the active power of God than in lifeless matter.

Finally, this explanation of life accounts for the origin of the first life, and for death. When the creative activity of God fashioned the cell, life came into existence, which is only another

Basis of Evolutionary Faith

way of saying that the creative activity of God's nature assumed a *new* manifestation different from its manifestations in matter and other forms of energy. When this form of God's activity is withdrawn from its interaction and interrelation with other forms of the energy of God's nature, the cell or individual dies. This death is not arbitrary but correlated with all the laws governing the organism and matter ; not supernatural but natural, i.e., according to natural law, or rather, the ordinary method of God's activity.

The mechanistic biologist is in difficulty all along the line, but most of all when he comes to the problem of the ultimate origin of life in the world. All the laws of biology indicate that at the present time there is no life that does not come from preceding life. Life does not now arise *de novo*, nor can it be fashioned in the laboratory. The chemical molecules that constitute living protoplasm can now be assembled in the proper proportions, but they refuse to become *alive*.¹ But if life does not arise *de novo* to-day, in the hypothetical Godless universe of the materialistic scientist, how could it ever have arisen *de novo* in the past ? Here is the

¹ Wilson : *op. cit.*, p. 878. This is not to ignore the recent experiments (1930) of men like Dr. Crile, of Cleveland, Ohio, who has recombined cell matter to function in many respects like a living cell. Such manufactured cells, of course, contain no chromosomes or genes, which are the centres of cell life and inheritance.

Origin and Nature of Life

insoluble riddle of mechanistic biology. The very principles under which he is carrying on his investigations demand that there shall be no supernatural intervention in the creation of life, yet every line of investigation points to such a beginning as creation postulates. The first life must have begun, and yet there is no force of nature nor combination of forces now acting capable of bringing life into existence !

It is this situation that has produced such wild hypotheses as the one that life came to earth from another planet. It has made most biologists close their eyes to the obvious conclusion that life was created and that God is back of and in the whole life process, controlling and guiding even the electrons in the molecules of the genes. Most biologists, therefore, are agnostic as to the origin of life, because they refuse to accept the obvious, and hope against hope that some mechanistic means of producing life may yet be discovered. Common sense demands that the obvious be accepted and that it be admitted by biologists that the first life must have been *created* !

But if a personal God must be brought into the process to account for the origin of life, is not the whole antecedent objection to the creation of the different forms and kinds of life *de novo* likewise removed ? Certainly it would take no

Basis of Evolutionary Faith

more power on the part of God to create the different families or orders of life known in the world to-day and in the past geological ages, than it would to create a single cell with all the potentialities of all the future kinds of life hidden in the genes of the chromosomes, as many biologists think was the case with the first cell in the beginning. If a supernatural act of God has to be brought into the process somewhere, there can be no *a priori* objection to the theory of specific creation, on the ground that it demands an act of supernatural intervention in the universe. It remains purely a question of fact as to which method God used to create the organic world. The evidence on both sides must be weighed, and if a judgment can be formed, it must be rendered on a factual basis.

CHAPTER VI

THE PRIMORDIAL CELL THEORY VERSUS MULTIPLE CREATIONISM

BEFORE presenting the evidence on the subject of evolution, let us clarify the issue by considering briefly the contrasted views as to the origin of species, held by evolutionists and non-evolutionists. There are two views as to the origin of species commonly held among evolutionists. The first view is that all the multiple forms of life that have ever existed in the world sprang originally from a single primordial cell. This view is the one taught by all the older evolutionists, and is still widely held to-day. In recent years, in order to relieve the single cell theory of a few of its most difficult problems, the theory has been advanced that all life sprang from a number of separate cells, from which all the myriad species evolved.

As has been said in previous chapters, if it were held by the evolutionists that God created the first life and controlled and guided the whole evolutionary process, there would be no antecedent theological objection to such a view, if the evidence favoured it. Theological objection arises to these views when it is claimed or assumed that God had

Basis of Evolutionary Faith

nothing to do with the origin of the first cells, or with their development into the various species. Obviously, if the evidence is against the theory of the development of species from primordial cells, it will be impossible to rule God out of the process, and it will make the materialistic view of the universe impossible. While the theistic view of the world is *possible* for an evolutionist, it is far easier for him to assume the non-theistic view, and therefore, when we find that the evidence seems to be against evolution, to disprove evolution seems the easiest way to vindicate theism.

Those who oppose the theory of evolution to-day are no longer disposed to deny that there is a vast amount of change and even development in the world of life. It is admitted that new varieties are constantly being formed artificially and probably are being continually formed in the natural state, through the mechanism of inheritance now known and used by geneticists. It is even thought quite probable that large numbers of what are now called species are merely varieties of the originally created species, which have broken up or "developed" into the present species. It is even possible that when God created the original species, they corresponded roughly in many cases to the present genera, families, or perhaps in some cases even to the present orders, and that the present species are

Primordial Cell v. Multiple Creationism

all descended from those broader species as first created. This view in its fundamentals, is that the first life as created was multiple life, with organs already differentiated, and with all the characteristics of later species already present explicitly in the somatoplasm, or latently in the germ plasm.

The fundamental point at issue between evolutionists and anti-evolutionists seems to be as to whether life was created as a finished product, or whether the first life was merely unicellular life from which all other forms of life evolved. Does the evidence show that the first life on the earth was only unicellular, or does it indicate that God may have brought animals and plants into existence by the word of His power? Before going into the discussion of the evidence itself let us compare the theories.

According to most evolutionists, life started on the earth with either a unicellular organism or a group of unicellular organisms, and by virtue of inherent forces evolved into all the present forms of plant and animal life. Those first cells, if they really existed alone, must have been unicellular organisms with chlorophyll present in them, for without chlorophyll they could never have existed in a world of inorganic matter, with no carbon or nitrogen in a form that could be appropriated by animal organisms. Animals live on plants or other animals, and

Basis of Evolutionary Faith

only plant life with the aid of chlorophyll can appropriate nitrogen from the air, and live. Moreover, since it is now known that neither environment changes nor natural selection can produce a heritable change in an organism that is not already latent in the organism, it would be necessary to postulate a cell or cells with a large number of chromosomes, which in turn would have to possess nearly an infinite number of genes arranged in a serial order on each chromosome, in order to account for all the infinite variety of characteristics and differences which all the animals and plants in the world possess to-day. These cells would have to possess genes which, when released from dominant gene control by some mysterious process would be capable of producing the remarkable change known as sexual reproduction. They would have to possess other genes capable under similar processes of producing all the infinite differentiations of plants and animals, such as leaves, roots, fruits, hair, fur, bones, eyes, ears, etc., whose variety is almost legion. They would have to possess genes capable of producing all the infinite variety of characteristics in animal organisms, from brain cells to feathers, from the colours on the wings of butterflies to the hairs on the feet of the polar bear, from the long neck of the giraffe to the

Primordial Cell v. Multiple Creationism

tail of the tadpole. All this, *mirabile dictu*, would have to be hidden in the first chromosomes of the first cells in the form of genes arranged serially along all the different chromosomes !¹

A mere glance at these necessary implications of this theory that all life sprang from unicellular organisms by a process of progressive differentiation, shows how ridiculous the idea is. The investigations of Morgan and his associates and followers on the *Drosophila Melanogaster* have definitely established the fact that there are at least four hundred genes on the four chromosomes of the *Drosophila*,² each one of which, under proper conditions, is capable of producing a certain definite characteristic in the adult fly, depending on the presence or absence of that particular gene, and on whether there is present or absent another gene which if present prevents the first gene from showing its effect in the offspring. Now if a minute insect like the *Drosophila* has that many genes, how would it be possible to have present in one cell all the genes necessary to produce all the characteristics in all the animals and plants that have ever lived on the earth? Yet, if evolution be true, that would have to be

¹ "There is at present no evidence that new genes arise except by changes in the constitution of old genes. The total number of the genes remains on the whole constant over long periods. Their number may be changed by . . . doubling the full set of chromosomes."—Morgan : *Theory of Gene* (1930), p. 94.

² Morgan : *Theory of Gene* (1930), page 11.

Basis of Evolutionary Faith

the case, for the investigations of Morgan and others have shown that the only way a given characteristic can be present in the offspring is that it be first present in the germ-cell as a gene on a chromosome.¹ Why cannot biologists see the absurdity of a theory that would necessitate such an impossible condition in the first cell? The only way we can account for that fact is to assume that biologists are not willing to follow to their logical conclusions the implications of these discoveries in genetics and cell constitution.

In contrast to this biological monstrosity, a cell or group of cells with such an infinite number of genes present in the chromosomes, consider the sanity of the view of multiple creationism as given in the account in Genesis, according to the most probable interpretation of the passage. The account of creation states that God in the beginning by His infinite power created, or "formed" the different kinds of animals and plants "each after its kind." Whether that means that God formed the individual species, or simply the genera or the families, is not taught in the Bible, and may well be left to scientific investigation to discover. According to our present knowledge of genetics, it seems very probable that these original creations were in

¹ We do not insist that a single gene alone is responsible for each characteristic. As Morgan points out, the characteristics may be produced by the interactivity of *all* the genes together.

Primordial Cell v. Multiple Creationism

some cases species (as man, for example), in other cases genera, in others families, and possibly even orders of life. From these original broad species or "kinds," sprang all the so-called species and varieties in existence to-day or which have existed in the past, through Mendelian variations and mutations. In all probability the original line of demarcation, at least in sexually reproduced organisms, was and is still marked by the ability to interbreed and produce fertile offspring, though it is possible that in some cases mutations inside the created group raised mechanical barriers to sexual reproduction which did not originally exist, so that species that do not now breed together may have originally done so. Another possible mark of species is the total number of genes originally bestowed by God. At present, the amount of chromosome material and genes seems fairly constant for each species, changing only by doubling the number of chromosomes, without adding new genes, as will be later seen.

A view such as this satisfies all the demands of biology as shown particularly in the science of genetics, does justice to the doctrine of creation "after its kind" taught in the first chapter of Genesis, and gives us a logical theory to account for the genes in the chromosomes. The other theory of a primordial cell or cells has insuperable

Basis of Evolutionary Faith

barriers of evidence against it, and demands a stretch of the imagination that seems impossible. The only real evidence is merely inferential, from the fact that some species to-day have apparently descended from broader species in the past, and therefore it is inferred that the species all descended from genera, the genera from families, the families from orders, and so on back to the original cell or cells. This is purely a matter of inference and assumption, with no direct evidence, in the nature of the case, obtainable, for all the ancestors of present species are dead, and there is no proof of any connection in the past, beyond the geological fossil remains which evolutionists assert give us the ancestors or relatives of present species. Naturally there is no way of *proving* that present species are related to the species found as fossils unless the species are exactly like the living species, in which case *there would be no evolution!* Any fossil species which differ in any way from living species may never have been connected with the present species, and may have disappeared without leaving any descendants! Thus the primordial cell theory is purely a matter of inference and assumption, and, as we shall later see, there is a great body of evidence against its truth. On the face of it, is not the theory of multiple creationism far more plausible?

CHAPTER VII

EVIDENCE FROM THE CHROMOSOMES

ONE of the strongest direct lines of evidence against evolution has come to light in cytology through the study of the chromosomes. It has been discovered that the *amount* of chromosome material in the cells of all the individuals of a species is the same, though in some cases the number of chromosomes differs, one of the chromosomes having in the past suffered an accident of some sort which separated the material, so that it now acts like an additional chromosome, though the chromosome material is the same in quantity as originally. "The total length of the chromosomes is thus a specific constant irrespective of their number."¹ By comparing the total length of the chromosomes, it is found that the amount is constant throughout the species. There is, of course, usually one more chromosome present in the germ cell of a female animal than in the male, the extra chromosome being the one which determines sex and makes

¹ Wilson : *op. cit.*, p. 878.

Basis of Evolutionary Faith

the individual a female. Thus, for man the chromosome number is 48 (for the female). For the monkey, it is 54. For dogs it is 22, while for cats it is 36, and for horses, 38. For the *Diestrammena marmorata*, of the insect group, the number is 58 (ten more than for man); but for the *Aphis saliceti*, the number is only 6, while, as has been said, the *Drosophila* has but four.¹ Some species have over 100 chromosomes, and it is claimed that in certain radiolaria the number is over 1,600.²

The above statements are true for a species ordinarily. However, sometimes the number of chromosomes in a species may be doubled, etc., producing what are called triploids, tetraploids, octoploids, etc. Of these Morgan says they "do not differ markedly in any special characters (except size) from the original diploid type."³ Different *kinds* of genes are not added by this process of doubling the chromosomes. The individual only has two or more genes just alike.

All this is very interesting for a sceptic in regard to evolution. If it had been possible to arrange the organisms with their varying chromosome numbers in either an ascending or descending scale corresponding to the evolutionary tree prepared by comparative anatomists and

¹ Wilson: *op. cit.*, p. 754.

² Walter: *Genetics* (1930), p. 211.

³ *Theory of Genes* (1930), p. 311.

Evidence from the Chromosomes

embryologists, we can imagine how great an argument it would have made for evolutionists ! As it is, we find that insects may have very few chromosomes, or may have more chromosomes than man. We find that monkeys have more, and cats and dogs have fewer chromosomes than man. In fact there is absolutely no rhyme or reason, from an evolutionary point of view, for the number of chromosomes in the different species. It is this situation that leads Wilson to say : “ We must therefore admit the present inadequacy of attempts to reduce the chromosome numbers to any simple or consistent arithmetical rules. This conclusion . . . forms part of the evidence which indicates that the evolution of chromosome numbers has not followed a single or consistent course, but has taken place, on the whole, fitfully, irregularly, and in various ways.”¹ In fact, as Wilson says : “ Chromosome numbers may differ widely within the limits even of the smaller groups (genus or family) and sometimes even between closely related species.”² No wonder Wilson is led to say, with the candour that marks all his scientific work : “ We do not know with certainty, even in a single case, pre-

¹ *Theory of Gene* (1930), p. 868.

² *Theory of Gene* (1930), p. 866. Of course this close relation Wilson talks about is on the basis of evolutionary classification, and may or may not indicate actual genetic relationship, for the species referred to might have been separate from creation to the present time.

Basis of Evolutionary Faith

cisely how the chromosome number has changed from species to species.”¹

From the evolutionary point of view this is incomprehensible. Geneticists have shown that the chromosomes are carriers of the heredity characters, and that the numbers are fairly constant for each species. As has already been said, the doubling of chromosomes does not give *new* genes, but simply doubles the old ones. Now since according to evolutionists all evolution has been caused by “resident forces,” the conclusion seems inescapable that were the evolutionary hypothesis true there should be a definite relation between the amount of chromosome material in a given species and the amount of chromosome material in closely related (?) species in the same general group, while the number of chromosomes in this general group should differ markedly from the number in distant groups. The number or amount of chromosomes or chromosome material in mammals ought to group around a certain fixed number, while the number of chromosomes in insects ought to be at a far distant point in the scale of numbers. That is in general what we ought to find if evolution is true. On the contrary we find that it is absolutely impossible to reduce the chromosome numbers to any such

¹ *Theory of Gene* (1930), p. 884.

Evidence from the Chromosomes

scheme. They can neither claim that evolution started with a few chromosome numbers in the original cell and developed into a large number of chromosomes in the higher animals, nor can they claim that evolution started with a large number of chromosomes in the primordial cell and that evolution took place by the gradual elimination of chromosomes as the cells evolved into the higher animals; for man has a large number of chromosomes, and some of the lower animals, and even insects, have a larger number of chromosomes than man as well as a smaller number. Evolutionists are forced to admit that the evolution (*sic!*) of chromosome numbers "has taken place on the whole fitfully, irregularly, and in various ways!"

It is necessary to dwell in such detail upon the fact that the number of chromosomes cannot be arranged according to any evolutionary scheme, because we are here dealing with the very *mechanism of inheritance*, and if evolution is true it should show here if anywhere. When the Nuttall blood tests seemed to show a similarity between the blood of various species, evolutionists were certainly not slow to point it out, though the blood is not the carrier of heredity, and were such similarity a proven fact all it would prove would be the similarity of chemical composition, which no one doubts, and which would in no way

Basis of Evolutionary Faith

prove relationship, if the same God made them all after the same general pattern.

Now just imagine for a moment that the chromosome evidence were the other way, and that the higher animals had few chromosomes and that the lowest animals and single cell organisms had the highest number ! Would not the evolutionists point to such evidence as proof positive that the evolution of the higher animals had been by the loss of chromosomes possessed by the single cells ? Or suppose man had the highest number of chromosomes and the single cell organisms had only a few, with all the other animals ranged in between with a number of chromosomes corresponding to their proper place on the evolutionary tree. Would not evolutionists immediately claim that through some unknown means the species had evolved as they accumulated additional chromosomes ? We all know that were the facts thus, evolutionists would justifiably claim that they had discovered a direct proof of evolution !

Now when no such relationship is disclosed, though we are dealing, according to biologists' own claims, with the very mechanism of heredity, is not that the strongest kind of proof that there is no *actual* relationship between species ? All the difference in numbers between the chromosomes of the different species is understandable

Evidence from the Chromosomes

at once if we suppose the species to have been created separately, for in that case God prepared the necessary number of chromosomes to carry the genes which produce the given characteristics of the different species, and the number of the chromosomes in the different species had no relation to the similarity of form between the species.

This evidence from the number of the chromosomes seems to be the strongest kind of direct proof that the evolutionary theory is untrue. There is only one possible objection to the line of reasoning we have here presented. It might plausibly be argued by evolutionists that it is the genes on the chromosomes and not the chromosomes themselves that are concerned with heredity, and therefore that the number of chromosomes has nothing to do with evolution.

There are two lines of argument about the genes that must be considered. In the first place it is claimed that the genes are spatial entities, and therefore that they have spatial location, even though ultra-microscopic, on the chromosomes. If that is the case (and the evidence of Morgan and his associates seems to prove that it is) then there cannot help but be a very definite relation between the number of genes and the number of chromosomes in the germ

Basis of Evolutionary Faith

cells. If life started with a single cell or cells, genes could not be transferred from one species to another new one without transferring the chromosome material with them, for it is the chromosome material that carries the genes, if the chromosome material is not itself the gene. In that case, if evolution were true, it would be impossible for changes in inheritance to occur without a shifting of chromosome material, and such shifting of chromosome material would be in direct relation to the scale of evolution. In other words, a species which lost a gene through a mutation, would lose chromosome material corresponding to it and the greater the number of genes lost, the greater would be the loss of chromosome material. It is impossible to see how there could be any evolutionary change under such circumstances without there being a direct relation between the evolution and the chromosome material. Since there is no relation between the amount of chromosome material and the hypothetical evolutionary tree, the conclusion is impossible to escape that there has been no such evolutionary change.

In the second place, suppose it is claimed that genes are non-material in their constitution, and therefore are independent of the amount of chromosome material in the cells, what then? Such a claim would seem to be directly disproved

Evidence from the Chromosomes

by the experiments of Morgan and his associates, but were it the case it would be assuming a force present in them which could only be spiritual in its essence. If that force is not amenable to quantitative measurement, it cannot be handled in the laboratory, and becomes a "psychoïd" or "entelechy" of the vitalists, which would stultify all biological research. But even in that case it would be impossible to see how such a hypothetical force, which seemed to co-operate with spatial portions of chromosome material, could, in case evolution were true, avoid a direct evolutionary relationship to the amount of chromosome material with which it ordinarily co-operates.

Morgan's experiments have shown that even if such a spiritual force exists (a fact apparently disproved by his experiments) it invariably interacts with a particular part of each chromosome, and that when the chromosome material is transferred to another chromosome or individual, the activity of such a hypothetical force is likewise transferred. Thus whether the gene is material or spiritual, there could not help but be a direct relationship to the quantity of chromosome material with which it invariably acts. If that is true evolution would inevitably produce either an increase or a decrease in the amount of chromosome material correspond-

Basis of Evolutionary Faith

ing to the evolutionary change and the loss or acquisition of genes. Since there is no such correspondence, is not that direct proof that evolution has never occurred? This argument alone seems strong enough to overthrow the theory, but it is far from being the only evidence which we have on the subject as we shall see in later chapters.

CHAPTER VIII

EVIDENCE FROM GENETICS¹

SINCE the beginning of the twentieth century the science of genetics, that is, the science which deals with heredity and variation, has rapidly come into prominence. The rediscovery in 1900 of the published work of Gregor Mendel turned biological investigation into an entirely new channel. The Darwinian theory with its view that all species varied constantly through an inner force that tended to make each generation slightly different from the ancestors, and also caused individuals to vary from each other by infinitesimal degrees in every conceivable direction, seemed to provide the raw material,

¹ The best books on this subject are as follows : W. Bateson : *Mendel's Principles of Heredity* (1913), *Problems of Genetics* (1913), E. G. Conklin : *Heredity and Environment in the Development of Men* (1916), T. H. Morgan : *The Physical Basis of Heredity* (1919), H. E. Walters : *Genetics* (1930), W. E. Castle : *Genetics and Eugenics* (1924), F. A. E. Crew : *Animal Genetics* (1925), E. W. McBride : *Heredity* (1925), E. B. Wilson : *The Cell*, Revised Edition (1930), P. Kammerer : *Inheritance of Acquired Characters* (1925), T. H. Morgan : *Evolution and Genetics* (1925), *The Theory of the Gene* (1930), Best book. J. A. Thomson : *Heredity*, Revised Edition (1926), *Encyclopædia Britannica*, Thirteenth and Fourteenth Editions (1926 and 1930). Articles on *Genetics*, *Mendelism*, *Cytology*, *Heredity*, *Embryology*, *Evolution* ; *Bibliographica Genetica*.

Basis of Evolutionary Faith

which, through the struggle for existence, eliminated the unfit and gradually caused the species to grow apart by preserving and handing on these variations to each following generation, until at last a new species was formed by the separation in space of the different lines of descendants after they had varied sufficiently to make the species distinct. In this way, according to Darwinism, new species gradually, over periods of millions of years, came into existence, and life became increasingly complex and differentiated on the earth.

Not only was it assumed that individuals and species varied from each other in every conceivable manner, thus giving natural selection materials with which to work by the elimination of the unfit, and by the inheritance of desirable variations which accumulated in time to produce new species ; it was also assumed that when an individual was placed in an environment which demanded adaptive changes of the individual in order for it to live successfully, some inner urge within the individual produced the changes demanded, and thus it gradually acquired new characteristics which, when they were handed on to the next generation, enabled the species to advance in the evolutionary scale. Of course this process took millions of years, but the biologist had all the time there was at his disposal,

Evidence from Genetics

so he went confidently and unhesitatingly on his way describing the "history" of the changes which he claimed had marked the evolution of all forms of life.

MISTAKE IN NAME

The work of Weismann on the germ plasm brought into disrepute the Le Marckian theory that evolution had proceeded through the inheritance of acquired characteristics, for Weismann proved that the germ plasm of the individual, which carried all the mechanism of heredity, was set apart at the very beginning of cell division in the new life, so that there seemed no way by which changes in the body, the somatoplasm, could be registered in the germ cells (except by chemicals which directly attacked the germ cells in the parent) for the body merely acted as a receptacle for the transmission of the life in the germ cells to the following generation. Thus there seemed no way by which the necessary changes in the germ plasm could be called forth upon the occasion of a change in environment, since the environment could not affect the germ cell directly, even though it were possible for the germ cell to make such advantageous variations upon demand.

The stage was in this way prepared for the rediscovery of the work of Mendel, which was received, when brought to the attention of the scientific world by DeVries and others, with

Basis of Evolutionary Faith

an enthusiasm which it could never have received while the reign of Darwinism was at its height. Mendel, contrary to the usual mode of experimentation at the time, concentrated upon an experiment in which the hereditary factors could be controlled, and by thus avoiding the conflicting elements which would tend to conceal the evidence he was enabled to formulate what is now known as Mendel's Law.

By artificially crossing tall green peas with short green peas, he found that the first generation (commonly called the F_1 generation) consisted of all tall green peas. Upon planting these however, he found that the next generation (commonly called the F_2 generation) broke up according to the proportion of three tall to one short. One of the tall, when planted, produced only tall thereafter, in that race, unless crossed again with short peas, showing that it was pure in respect to the tall quality. The other two tall of the F_2 generation, like the F_1 generation, broke up according to the proportion of three tall to one short. Of the three tall of the F_3 generation, one was pure, and two mixed. The short pea in both the F_2 and F_3 , and all following generations, produced only short peas when planted, unless again crossed with tall peas, thus showing that it was pure in respect to the short quality. These facts can now be ex-

Evidence from Genetics

plained in two ways,¹ though Mendel's theory was that there was present in the individual what he called a "unit character" (now called "gene"), which produced the characteristic for tallness in the peas. Whenever this gene for tallness was present in the individual, the individual was always tall, or "dominant" over the quality of shortness, even when that quality was actually present as shown by the descendants. The shortness quality was therefore called "recessive" because it receded into the background whenever the "dominant" gene was present.

When the two germ-cells unite to form the cell which begins a new individual, that united cell is called a "zygote." When this zygote is composed of germ-cells which are alike in regard to some characteristic, as tallness, it is said to be *homozygous* in respect to that characteristic, and would be represented by the symbol (in the case of tallness) *TT*, or in case the characteristic were shortness, the symbol would be *ss* (the capital letter denoting which is dominant). In case, however, one germ-cell contained a gene for tallness while the other germ-cell contained the gene for shortness, on fertilization the resulting zygote is said to be *heterozygous* in respect to the contrasted quality,

¹ *Ency. Brit.*, 13th Ed., Sup. Vol. II, p. 163, *Genetics*.

Basis of Evolutionary Faith

and would be denoted (in the case of the genes for tallness and shortness) by the symbol T_s . (This symbolism is not always used in case of such contrasted genes as tallness and shortness, and the symbols T and t are used, denoting the presence or absence of the quality for tallness.) Such pairs of contrasted characteristics are called *allelomorphs*.

For some time these facts were explained as being due to the presence or absence of the gene which produces tallness (or similar dominant characteristic) which explains the use of the symbolism Tt . It was soon found, however, that all the facts could not be explained on that assumption, for in some cases the F_1 generation was totally unlike either parent, though the F_2 generation broke up according to Mendel's Law. For example, when a rose-combed chicken is crossed with a pea-combed chicken, the next generation gives chickens with walnut combs of the Malay fowl.¹ In other cases the F_1 generation is midway between the two parents, neither one seeming to be dominant. These and other facts seem to show that the recessive character should be considered a real gene, with a definite characteristic of its own, instead of being merely the lack of the dominant gene. It may be that the presence of an inhibitor prevents

¹ *Ency. Brit.*, Sup. Vol. II, p. 161.

Evidence from Genetics

it from showing itself in the F_1 generation in cases of dominance, or that the absence of that inhibitor enables both characters to take effect in the case of heterozygous cells which are midway between the parents. This whole subject still remains obscure and we must wait for future experiments to clear up the exact relationship between the genes in their effect upon the organism.

Mendel's second experiment was to cross "a variety of pea with a round seed and yellow cotyledons with another variety having a wrinkled seed and green cotyledons. The F_1 individuals were all yellow rounds, and when these were selfed (i.e., bred to themselves) a generation was produced in which in every 16 individuals on the average there were :

Nine with yellow cotyledons and round seeds—the two dominant characters.

Three with yellow cotyledons and wrinkled seeds—one dominant, one recessive.

Three with green cotyledons and round seeds—one recessive, one dominant.

One with green cotyledons and wrinkled seeds—the two recessives."¹

When plants with three dominant genes on separate chromosomes are bred with plants having three contrasted recessive genes, on separate

¹ Crew ; *Animal Genetics*, p. 28.

Basis of Evolutionary Faith

chromosomes, the F_2 generation contains eight possible combinations in every sixty-four individuals, according to approximately the following proportion :

Twenty-seven individuals in which there are the three dominant genes.

Nine individuals in which there are two dominants and one recessive in one group.

Nine individuals in which there are two dominants and one recessive in a second group.

Nine individuals in which there are two dominants and one recessive in a third group.

Three individuals in one group which have one dominant and two recessive genes.

Three individuals in a second group which have one dominant and two recessive genes.

Three individuals in a third group which have one dominant and two recessive genes.

One individual in which there are three recessive genes.

It will readily be seen that when more than six contrasted genes are combined by cross breeding, the problem becomes increasingly complex in a geometrical progression, unless linkage restricts the number of combinations, making the possible combinations almost unlimited. For our purpose, however, the important thing is not the various ratios (which can be accurately computed if the genes and their activity in

Evidence from Genetics

the parents are known), but the fact that in the reshuffling of chromosomes bearing the genes which precedes cell-division in the formation of the zygotes in the F_2 generation, when more than two contrasted genes are combined, individuals are produced which are *unlike* either parent, though the genes themselves were all present in the parents. Thus in Mendel's experiment quoted above, two new varieties were produced, round green and wrinkled yellow, which will both breed true, because, though one character is a dominant and the other a recessive, they are not the contrasted genes of an allelomorph pair. Thus, according to Mendel's Law, new varieties can be increased almost indefinitely, by combining a sufficient number of genes in the crossing process, and awaiting the reshuffling of genes which takes place in the F_2 generation, provided linkage does not hinder the combinations.

It was formerly thought that these Mendelian variations were the raw material for evolution and that by natural selection favourable varieties survived and with the lapse of time became new species. There are, however, two insuperable difficulties in the way of such a view. In the first place, all evolutionists agree that the process of evolution started with primordial cells which reproduce themselves by the process of cell-division. *Mendel's Law, however, does not apply*

Basis of Evolutionary Faith

to the process of cell-division reproduction, and therefore no new varieties could have arisen according to Mendel's Law by Mendelian variations at that stage of life when according to the evolutionist the only life on the earth was unicellular ! This fact at once rules out Mendelian variations as a source of evolution.

In the second place, if evolution be defined as progressive change from the simple and undifferentiated forms of life to the complex and highly differentiated forms of life, there must have been a continual influx of new characteristics into the stream of life. For example, how did eyes originate in an eyeless unicellular organism, according to the evolutionary theory, unless new characteristics entered the stream of life from without ? According to the new knowledge of genetics, every such characteristic is due to a gene, or to the combined action of all the genes on the chromosomes ; if evolution is true, then, unless the gene for eyes was hidden all the time through the countless generations of life up to the point where the organism became sufficiently differentiated to use eyes, such a gene must have come into the stream of life from without.

But Mendelian variations are of an entirely different kind. Instead of coming into the stream of life from without, they are simply a

Evidence from Genetics

reshuffling of characteristics already present in the race. That is, if there are fifty genes present in the male parent, and an equal number in the female parent, these genes, most or all of which are linked to the various chromosomes in linkage groups, may combine in as many new combinations as the reshuffling of the chromosomes with the linkage groups will permit, but the new varieties thus formed will contain *only the characteristics of the original genes present in the parents!* No *new* characteristic is ever added by Mendelian variations, and without the *addition of such new characteristics, how could evolution ever occur?* If there was no gene or combination of genes for the production of feathers of birds in the parents, unless such genes were added, how could feathers of birds ever evolve? When evolutionists could talk of plastic protoplasm which was shaped into any required form by constant changes in every direction, it was easy to answer such questions by appealing to time and natural selection. Now, however, when we know that protoplasm is not changing constantly in every direction, and that only genes which are already present in the chromosomes can produce definite characteristics in the adult organism, such questions are impossible for the evolutionist to answer. At any rate we know that Mendelian changes can never produce evolution, for the

Basis of Evolutionary Faith

organism can never get out of the circle of genes with which it started, and without special creation new genes cannot be added to the circle.

Since the rediscovery of Mendelism, great progress has been made by experimentation along lines suggested by the discoveries of Mendel. It has been found that in many cases there are two or more factors for the same characteristic, and when both factors are present the amount of the given characteristic is doubled or trebled as the case may be. The length of the ears of the Belgian hare is an example of this, and it is now thought that the whole gamut of colours in plants such as sweet peas is due to these cumulative genes. When one gene is absent, the colour is changed. When two of these cumulative genes are absent, the colour is modified still more, etc. In the case of the ears of the Belgian hare, whenever one of the cumulative genes is absent, a fraction of the length of the ears is subtracted, and when two genes are missing, another fraction of the length of the ears is subtracted, etc.

The next important fact that has been discovered is what has been called "linkage." Certain genes, if not all, seem to be linked together on each chromosome, and segregate before cell division, and are transmitted, in linkage groups, rather than individually. No

Evidence from Genetics

case has been discovered where the number of linkage groups exceeded the number of chromosomes, so it is thought that each linkage group is located serially on the chromosomes. Certain characteristics are known to be linked to the sex chromosomes, being inherited according to the sex of the individual. Colour blindness seems to be such a sex-linked gene. Because of this fact of linkage, the number of new combinations of the genes is limited unless there is what is called "crossing-over." The work of Morgan and his associates on the *Drosophila melanogaster* has brought to light the curious phenomenon just mentioned, and it is by observing the percentages of these "cross-overs," that the location of each particular gene is determined on each chromosome.

In the process that precedes the cell division of the fertilized egg, the chromosomes of the egg and sperm arrange themselves alongside each other. As they separate again, before cell division, apparently they become so twisted around each other that a break will occur at the point where they touch, so that the end of one chromosome becomes attached to the upper part of the other, while the rest of the first chromosome becomes attached to the rest of the second chromosome, thus causing the genes to be separated in the original chromosome, so that

Basis of Evolutionary Faith

if an inhibitor was present in one part of the chromosome, which prevented a gene in the lower half from showing in the somatoplasm, the cross-over will allow the inhibited gene to produce a mutation. Another explanation is that they exchange genes through some mysterious process, without exchanging the matter of the chromosomes themselves, for some biologists hold that there is no evidence that the chromosomes exchange portions of themselves.

Whatever it is that actually happens, the cells act as though the individual with one of these chromosomes had genes belonging to the lower half of the original chromosome, while on the upper half of this chromosome, there seem to be genes belonging to the upper half of the other chromosome, apparently proving that there has been a crossing-over of the genes from one chromosome to the other. The result of such a crossing-over is usually a *mutation* affecting some portion of the organism. By breeding the individuals having such *mutations* back to the original stock, eventually a crossing-over the other way takes place which covers up the mutated characteristic, showing that in all probability either an inhibitor on the upper half of the chromosome prevented the gene on the lower half from producing the characteristic or that the genes on the upper half of the

Evidence from Genetics

chromosome inhibited the expression of, or were dominant over the genes on the lower half of the chromosome, and as long as both were present in the same chromosome, it was impossible for the second genes to produce their normal effect as they were linked with an inhibitor to the same chromosome. When the crossing-over occurred, the restraining influence was removed and the hidden gene manifested itself in the somatoplasm as a mutation which bred true as long as it was free from the original inhibiting genes.

The percentages of the probability of such crossings-over with the resultant mutations have been plotted quite accurately for the *Drosophila melanogaster* by Morgan and his associates,¹ and the assumption is that the same condition exists in all other forms of life and that almost, if not all, mutations are the result of such crossings-over. If such proves to be the case, as these experiments indicate, it means that even mutations have at last been brought under a definite law, and that nothing can probably occur in an organism as a result of a mutation which was not previously present as a gene on the chromosome.

There is still the possibility that some mutations are caused by a change of some sort in the gene itself. It is still uncertain whether all mutations may not be explained by the *loss* of a gene, so that

¹ *Bibliographica Genetica*, p. 87 ff.

Basis of Evolutionary Faith

all the other genes acting together in the absence of the lost gene, produce the mutation. If, however, the mutation is caused by a change in the gene itself, it is probably a chemical change of some sort. Whatever future investigation may reveal about this obscure point, it is practically certain that all the species could not have arisen in this way, for according to Morgan¹: "Since most of the mutants are weaker or less well-adapted types than the wild types, they disappear before they are recognised." The genes normally are constant for each species, and any such mutation would probably soon disappear in the natural state.

In view of these discoveries, it is no longer possible to claim that all these genes of all living and dead species were present on the chromosomes of the primordial cells. If they had been so present, they would have manifested themselves as mutations immediately within a comparatively few generations, and not after the long periods of millions of years, such as the evolutionist postulates. In other words, practically all the mutations which we now know about take place according to a fixed percentage in a definite number of generations. If this is true now, is there not every reason to believe that such has always been the case? But if that is true,

¹ *Theory of Gene* (1930), p. 65

Evidence from Genetics

the mutations would *all* have manifested themselves according to a definite percentage in a fixed number of generations, at the very dawn of evolutionary history, instead of waiting millions of years to show themselves as the evolutionists postulate in geology !

To sum up, it now seems evident that the only kind of heritable variations are variations according to Mendel's Law, and mutations which result from the crossing-over of genes from one chromosome to another, or possibly by a change in the nature of the gene itself. Neither can be the source of evolutionary changes, for both merely deal with genes already present in the chromosomes, and not with new characteristics which have never shown themselves previously in the history of the race. So far as is now known, there are no variations occurring to-day in nature which involve new characteristics not previously present in potentiality in the germ cells, and all of the characteristics which show themselves to-day as mutations, at least wherever exact experiments in genetics have been made, can be treated in a manner similar to the way in which we treat Mendelian variations, namely as definite genes which shift back and forth from one chromosome to another, by the process of crossing-over, or possibly by a chemical change in the gene itself.

Basis of Evolutionary Faith

Darwin's theory of "minute variations" in every conceivable direction, which he supposed every form of life was making constantly, thus giving the raw material for natural selection to shape into new species, has been proven false by biologists. It is now known that such variations are merely fluctuations around a given mean, to which mean the offspring constantly tend to return. "The belief that substantial genetic change commonly accrues by summation of impalpable differences has been generally abandoned as devoid of evidential foundation. Such differences are mostly fluctuational, largely dependent on circumstance rather than on genetical units and hence not transmissible. Summation, when a genuine phenomenon, is a consequence of purification or the attainment of homozygosis. The idea that a characteristic could in any other way increase as a result of selection is out of place in an exact or even a logical science."¹

A very suggestive fact in connection with mutations, is that a great proportion of these cross-over mutations or point mutations are non-viable,² while the vast majority of them are of little or no advantage to the individual possessing them, since they are all recessive characteristics and usually represent the loss of a characteristic

¹ *Ency. Brit.*, *ibid.*, Vol. II, p. 868.

² *Ibid.*, p. 868. Morgan: *Theory of Gene* (1930), p. 65, 188, and 132.

Evidence from Genetics

present in the somatoplasm of the ancestors. The important fact for us is that such mutations are *never* additions of new characteristics not previously present in the germ-plasm, and that such mutations never take the organism *outside the bounds of the species* !¹ We get out of both mutations and Mendelian variations just what we put in in the way of genes present on the chromosomes.

It is these facts that have led evolutionists to recognize that there are no known causes capable of producing evolution, and have led them to fall back upon faith in geological evidence and certain other lines of evidence, which convince them that evolution is a fact whether they can explain it or not. We shall take these up in detail later.

The full significance of these discoveries about the mutations of the *Drosophila* has not yet been perceived by most biologists. If it is really proved at last that mutations are shut up within the bounds of the characteristics previously present in the ancestors, it means that the *only possible change of evolution must be downward by way of loss and elimination of genes previously present in the chromosomes or perhaps by a chemical change in the genes themselves* ! In other words what change there has been in nature instead of

¹ *Ency. Brit.*, 13th Ed., Sup. Vol. II, p. 868.

Basis of Evolutionary Faith

being from the simple and less differentiated organisms to the more complex and highly differentiated organisms, as the evolutionist has always assumed, has in reality been in the *opposite direction* ! The only logical deduction that can be made from this is that there were originally created a great variety of forms of life, and that the forms of life now present in the world represent degeneration by way of loss of the characteristics present in the ancestral type, and also the new varieties which have been built by artificial selection according to Mendel's Law. This view will be seen to include all the phenomena of genetics discovered up to the present time.

In fact the evolutionists of to-day are diluting the idea of evolution to include all kinds of change of whatever kind. For example, Vernon Kellogg recently defined evolution simply as "change."¹ Needless to say this is merely an attempt to give plausibility to the idea that species have developed from lower organisms, by including in the definition of evolution facts which no one denies. Reduced to syllogistic form the argument is as follows : Change of various kinds is constantly occurring in nature. Evolution is change. Therefore the evolution

¹ Vernon Kellogg, *Scribner's Magazine*, July, 1928, "The Evolutionist and Death."

Evidence from Genetics

of all species from lower organisms is a proved fact. Students of logic will detect the fallacy at once. Evolution if true would indeed be change, but not all change is evolution, and the change which is constantly occurring in nature is just the opposite of evolution, and in no way proves that species have developed from lower organisms.

We have shown in a previous chapter that the mechanical constitution of the cell would prevent all the genes necessary to produce all the various forms of life in the world from being in one cell, as some evolutionists (Bateson, for example) have suggested. One cell could not contain enough chromosomes with enough genes for such a possibility to be seriously considered. But if this is impossible, the only remaining solution is that life was originally created in a multiplex condition, either with a great many original germ cells or with a very great number of orders, families, genera, and species, though probably many of these species which we see to-day are the result of Mendelian variations, and were not created in the present form.

The evidence that all inheritance comes through the germ-plasm only has seemed so conclusive to biologists that very few of them have received the new arguments and evidence on the subject of acquired characteristics, with favour. However, in the last few years, there

Basis of Evolutionary Faith

has been accumulating quite a quantity of the evidence which has made it necessary to reopen the whole subject of the heritability of acquired characteristics. To avoid ambiguity, we must sharply distinguish between two ideas on this subject : (a) the question of whether an external influence can affect both the body cells and the germ cells at the same time so that an acquired characteristic seems to be inherited, (b) and the question of whether a characteristic which affects only the body cells can be transmitted to the offspring. In one sense of the term, both such characteristics, if heritable, would be considered acquired characteristics, but it is obvious that influences which affect only the body cells are the only common acquired characteristics, and that the real question at issue in the discussion of the heritability of acquired characteristics concerns such characteristics which affect only the body cells.

There is indubitable evidence to show that alcohol¹ and certain chemicals affect not only the the body cells but also the germ cells, causing changes in them which are heritable. Such changes, however, are uniformly those which result in injury to the germ cells, producing deformity, or defects of some sort in the organism. While such changes are heritable, it is equally

¹ *Ency. Brit., ibid.*, Vol. II, p. 348.

Evidence from Genetics

true that they cannot be the cause of evolutionary changes, since they merely *take away* characteristics previously possessed by the organism. The artificially produced eye defects in rabbits, in the elaborate experiments of Guyer and Smith, seem to be changes of this kind. "Guyer and Smith made an emulsion of the lens of the eye of a rabbit in Ringer's solution and injected it into the blood of a fowl. After an interval of three weeks the serum of the fowl's blood had acquired the power of attacking and dissolving the lens of the rabbit's eye. If now this serum were injected into the veins of a pregnant rabbit some of the embryos were born with minute defective lenses. If these young were allowed to breed the defect could be transmitted through six generations without any further administration of serum, and was, moreover, transmitted through the male, so that any explanation of the transmission by a supposititious infection of the embryos of each generation through the placenta of the mother was excluded.

"Guyer was driven to the conclusion that the germ-cells of the rabbits originally injected had acquired the power of forming a 'cytolysm' which destroyed the lens, and that this power was transmitted by heredity."¹

It is questionable whether this explanation

¹ *Ency. Brit.*, *ibid.*, Vol. I, p. 1080; cf. Vol. II, p. 348.

Basis of Evolutionary Faith

is correct or whether the original injection destroyed the genes which produced perfect lenses in the rabbits' eyes, and of course, if that happened, all future generations would lack that gene, but whichever explanation is correct, what has happened is that characteristics previously possessed by the rabbits have been destroyed or neutralized, which plainly is not evolution.

The experiment of Durkhen¹ with the common white butterfly seems to fall within the class of influences affecting the somatoplasm which are then transmitted in the germ-plasm to the ensuing generations. Durkhen put the caterpillars of this butterfly in boxes covered with orange-coloured glass, and raised several generations under such conditions. The orange-coloured glass prevented the formation of the white pigment with black dots in the skin of the pupa, and allowed the green blood to shine through. Four per cent. of the pupæ are ordinarily green, but under such conditions sixty-five per cent. were green in the first generation, and ninety-five per cent. were green in the second generation under similar conditions. When that generation was exposed to ordinary light, thirty-four per cent. were still green as a result of the conditions which affected their parents.

At first thought this seems to be a clear instance

¹ *Ibid.*, Vol. I, p. 1080.

Evidence from Genetics

of the inheritance of acquired characteristics, but upon closer scrutiny the experiment is seen to be inconclusive. As stated above, four per cent. of the pupæ are ordinarily green, showing that the race is mixed in its Mendelian genes, the green producing gene apparently being recessive. A possible explanation of the large increase of green pupæ in the following generations is that the action of orange-coloured glass in preventing the development of the usual pigment, either rendered the germ-cells having the usual pigment-producing genes non-viable, or destroyed the genes for such pigment production in a number of cases. That would account for the preponderance of green pupæ in the generation exposed to ordinary sunlight. At any rate, since four per cent. of the pupæ ordinarily are green, there is every reason to believe that the pigment-producing genes are superimposed on genes which, when the pigment-producing genes are absent, or inactive, produce green pupæ. There is therefore nothing to indicate that this experiment has added anything to the inheritance factors of the race, but rather that it has suppressed or destroyed characteristics previously present. Such changes therefore cannot be the cause of evolution because they add nothing to the stream of heredity of the race.

Kammerer's experiments with the European

Basis of Evolutionary Faith

fire-salamander were very interesting.¹ He reared specimens in cages the walls of which were coloured yellow or black. As is well known the salamander possesses the ability of changing its colour to match its background to a certain extent. The skins are ordinarily black with yellow splotches. The extent of the yellow pigment varies with different individuals. Kammerer placed the relatively black individuals in yellow cages and the relatively yellow individuals in black cages. The ones in yellow cages gradually produced two broad longitudinal dorsal bands of yellow, while the ones in the black cages turned almost black with only tiny yellow dots. When two of these yellowed individuals were mated and their offspring reared in yellow boxes, the yellow increased so in extent that the black almost disappeared. When the offspring were placed in black cages, the yellow pigment still increased quantitatively for the first year, due, apparently, to the influence of parental conditions. After the first year the black environment began to take effect and the yellow pigment was ultimately reduced to small spots.

Doubt has been cast upon Kammerer's experiments by the fact that he finally discovered that his assistants had tampered with his photo-

¹ *Ibid.*, p. 1080.

Evidence from Genetics

graphic plates covering the period of years, and that he had no way of telling whether they really proved what he had claimed or not. In order to show his own sincerity in the matter he committed suicide, thus leaving the whole question of what his experiments had proved, undecided. In view of the falsification of the evidence, it is of course impossible to draw any definite conclusions, but even if the facts should prove to be in general what Kammerer originally claimed, they would still be far from proving that heritable acquired characteristics capable of producing evolutionary changes were proved to have occurred. We are almost entirely ignorant of the genes in the salamander, and of their influence upon the strange ability to change the colour of the skin according to the surroundings. Until we know more of this, conclusions cannot be drawn as to the influence of environment on the heritable factors in the genes of the salamander. At most, these experiments would only show that a characteristic already present could be increased in its effects upon the offspring by environment, and not that a new characteristic could be added, and without the addition of a new characteristic there can be no evolution.¹

Many other similar instances have been cited,

¹ Cf. Crew : *Animal Genetics*, p. 345 ff.

Basis of Evolutionary Faith

but in no case has an acquired characteristic capable of producing evolution been shown to be inherited. In fact, while it cannot be stated with assurance that no acquired characteristic can be inherited, the evidence is conclusive that at least the inheritance of such characteristics is very rare, and in no case can the inheritance of a characteristic capable of producing evolution be shown to have occurred, if by evolution is meant progressive change from the simple to the complex and the addition of new characteristics to the race.

The experiments of Pavlov in training mice are likewise inconclusive on this point. He trained mice so that they learned to come for their food at the call of an electric bell. It took 300 lessons to train the first generation, 100 lessons to train the second, thirty lessons to train the third, ten to train the fourth, and only five to train the fifth generation of mice. As Crew points out, mice may differ among themselves as to their responsiveness to a given stimulus, so that the whole experiment may have been merely an example of selective breeding according to Mendel's Law. According to Crew,¹ three other investigators who repeated the experiments, Vicari, MacDowell, and Bagg, found that these results were not corroborated in their experiments.

¹ *Ibid.*, p. 350.

Evidence from Genetics

The consensus of biological opinion to-day is to reject the recent claims that acquired characteristics are inherited.¹ At any rate, even if it be shown that in a few cases such characteristics are inherited, the general conclusions of years of biological research are that such cases are the rare exception, and that none of those which have been attested proves to be a possible cause of evolution.

But if these many kinds of variations which we have examined are of such a nature that they could not be causes of evolution, what possible cause can remain? Absolutely none! Natural selection has long been seriously questioned, even as an effective means of killing off undesirable variations, for it has been shown that its action is quite as likely to kill off desirable variations. But even were it an actual force capable of doing what the Darwinians used to claim, it could never operate were there no continuous upward striving in the life of the world. As we have shown, biology has eliminated the possibility of there being variations which would indicate an upward striving among the various forms of life, so that to-day we know there is no such upward trend through variation as the Darwinians postulated, and that therefore

¹ E.g. Bateson: *Problems of Genetics*, p. 88; Crew: *op. cit.*, p. 339; Scott: *Theory of Evolution*, p. 156; *Ency. Brit.*, *op. cit.*, Vol. II, p. 869.

Basis of Evolutionary Faith

natural selection, even were it a real force capable of doing what the Darwinians claimed, would have no raw materials of change upon which to work. Change and variation we see in nature in abundance, but only change *within the limits of the characteristics previously present in the species!*¹ All possible causes of evolution have been examined and eliminated, but no cause capable of producing evolution has been discovered !

Under ordinary circumstances this would be sufficient to cause the abandonment of the theory of evolution, but, as has been said, evolutionary ideas are a part of the very warp and woof of scientific thought, and its abandonment would necessitate the abandonment of such a large portion of contemporary scientific ideas that most scientists cannot even contemplate it. They fall back on what they consider the conclusive evidence upon which evolutionists have for several decades relied to prove the correctness of the theory. Our task is now to investigate these various lines of evidence.

¹ *Ency. Brit., ibid.*, Vol. II, p. 165 ; Vol. II, p. 868.

CHAPTER IX

ALLEGED EVIDENCE FROM CLASSIFICATION

ONE of the principal lines of evidence in favour of evolution is the alleged evidence from classification. All forms of animal and plant life have been classified according to their varying degrees of similarity to each other, and the resulting classification is said to prove that all forms of life have descended from a single line or from a few lines which were originally unicellular organisms.

The object of such classification of all the forms of life both living and dead is very clearly stated by Professor Scott of Princeton University in the following words :

“ The object of classification is to arrange the extraordinarily manifold assemblages of animals and plants in groups of ascending comprehensiveness, which shall express, so nearly as the present state of knowledge permits, the degree of relationship between them.”¹

Since the days of the founder of the scheme of classification, Linnæus, all forms of animal

¹ W. B. Scott : *Theory of Evolution*, p. 32

Basis of Evolutionary Faith

life have been arranged in a comprehensive system which shows the alleged relationship between the different species, genera, families, orders, etc. The whole scheme resembles a tree, with the leaves representing the species ; the twigs, genera ; the small branches, families, and so on back to the trunk where it is alleged that all life began with the unicellular organisms from which all the manifold kinds of life are said to have sprung. " The principle in accordance with which these groups of an ascending order of comprehensiveness are constructed, is simply the greater or less degree of likeness in structural characteristics."¹ From this quotation, the meaning of the whole system of classification is perfectly plain, and it is clearly evident that the scheme is an arbitrary one, prepared for the purpose of proving evolution, and manufactured according to the ideas of the systematist who prepares the scheme of classification.

In regard to the details of the system there is no unanimity among scientists, and no two systems of classification are alike in all details, according as one scientist regards certain similarities between species as the essential marks which prove genetic relationship, while another scientist regards other organs which are similar to those of a different set of animals or plants, as the

¹ *Ibid.*, p. 33.

Evidence from Classification

features by which relationship is to be traced. One animal may be similar to another animal as to one set of organs, and if that set of organs were regarded as the norm of evolution, it could be classified accordingly, while it may be similar to another animal in regard to a different set of organs, and so classified in an entirely different group of animals if the second set of organs is regarded as the norm by which evolutionary relationship is to be traced. Only the subjective preferences of the systematist can decide which set of organs is to be taken as the norm of the evolutionary process, thus making the whole process of classification, to a large extent, subjective rather than objective, as any true science must be.

This fact is recognized by biologists themselves, as witness the following quotation : "The attempt to construct detailed phylogenies involves the assumption that one set of structures, which we take as the mark of the class, has remained constant, whilst others which are regarded as adaptive, may have been developed twice or thrice. As two sets of structures are often of about equal importance, it will be seen to what an enormous extent the personal equation enters in the determination of these questions."¹ From

¹ E. W. McBride : *Cambridge Natural History*, Vol. I, p. 460.
Quoted by Price : *Phantom of Organic Evolution*, p. 113.

Basis of Evolutionary Faith

this quotation it is clearly evident that the whole taxonomic system is a mechanical and arbitrary rather than a natural one. It depends upon the evolutionary theory for its classificatory principle, and upon the subjective preferences of the taxonomist for the application of the principle.

If this were the only objection against taxonomy as proving evolution we might regard classification as purely negative—neither offering positive evidence in favour of the evolutionary theory, nor affording any direct proof against the theory. However, when we begin to examine the problems of taxonomy closely, we find that a startling amount of direct proof *against* the evolutionary theory arises directly out of the difficulties of the taxonomist in constructing a logical and “natural” taxonomic system. It appears that it is absolutely impossible to construct a system of classification that will exclude cases of what is called “convergence,” and such being the case, all systems of classification become worthless as evidence to prove the lines of descent of animals or plants according to evolutionary theory.

Before explaining the meaning of “convergence,” it will be necessary to explain the meaning of “homologous” and “analogous.” When two parts of an organism are regarded by evolutionists as having a common genetic

Evidence from Classification

origin, that is, when they are thought to have arisen from the same organic part of a hypothetical evolutionary ancestor, or when they are now found to arise from corresponding embryonic structures in animals or plants which are declared to be closely related evolutionally, these parts are called *homologous*, no matter how the animals may use the organs at present. A familiar illustration is found in the arm of a man, the fore limb of a dog, the wing of a bird and the flipper of a whale, all of which are said to be *homologous* because they arise from similar embryonic structures, and are declared to have been evolved from some hypothetical ancestor which is said to have possessed a structure embodying the essential parts of these organs in these different species to-day. On the other hand, the wing of an insect, the wing of a bat, and the wing of a bird, are said to be *analogous* but not *homologous*, because, while they are used for the same purpose, they arise from different embryonic structures and of course differ in constitution to-day.

Now if evolution is true, similarity of structure ought always to indicate evolutionary relationship or descent, and ought to be caused *only* by direct genetic relationship. This would appear not only from the inherent probability of like begetting like, but from the gene theory of genetics.

Basis of Evolutionary Faith

According to this theory, as has already been shown in Chapter VIII, whenever the gene for a given characteristic is absent from the ancestors, it cannot appear in the descendants. Still more impossible would it be for a characteristic, such as the eyes of man or animals, absent from a given line of ancestors to appear among descendants of this line developing from a different embryonic structure. Genes simply cannot be inherited in any such manner. Theoretically it might be possible for a cross-over to occur, transferring such genes to a chromosome which would bring about a change in the location of the given characteristic in the anatomy of the animal, though practically such a change in inheritance would be highly improbable. If such a structure could be found, however, similar to structures in other animals, according to the gene theory of inheritance, it ought to be definite proof of direct genetic relationship.

The situation would be no better for the evolutionist were one to reject the gene theory of inheritance, or assert that characteristics can arise *de novo* and enter the stream of inheritance by chance. Of course such a view is rejected by modern biologists, but even were it true, there are limits to the laws of chance, and the presence of two structures, such as a complicated organ like an eye, appearing in man and a lower animal,

Evidence from Classification

would inevitably indicate genetic relationship, if evolution is true, for according to the laws of chance, a complicated organ like an eye could not be produced in unrelated animals, *independently*, twice, much less three times !

We are now ready to return to the phenomenon known as *convergence*. Paradoxical as it may seem, there are innumerable instances in nature where animals are said to be unrelated genetically, though they possess similar structures which are used for similar purposes ! The reasons why evolutionists are forced to make such an astounding assertion are either that these similar organs arise from totally different embryonic structures, or that other organs, taken as the norm of evolutionary development, are absent from one of the animals, so that this animal cannot be classed with the animal possessing these normative organs. Though the evolutionary relatives and ancestors of the given animal, none of them possess the characteristic in question, the given animal cannot be classed with the animal possessing the similar organ, because the first animal on account of the lack of other organs must be excluded from that genetic group ! This phenomenon is called *convergence*.

These points will become clear when we consider examples of *convergence*. The electric organs of fishes and eels furnish a good example

Basis of Evolutionary Faith

of convergence. Some of these various species have the electric organ on the head and others have it on the tail, thus precluding a common origin, it being manifestly improbable that the one kind could have inherited the electric organ from the other which has it in a different location on the body. In the case of the electric eel of South America, of the rays or skates of the genus *Torpedo*, and of the electric catfish of the rivers of Africa, we have organs which produce an appreciable electric shock, but which by no stretch of the imagination could have been derived from each other, when we consider the structures of these different animals.

Another example of convergence is found in the eyes of the higher animals, of cuttle-fishes, and of the pecten, a bivalve mollusc. The eye of the cuttle-fish has a true retina, a sclerotic, a choroid, a vitreous humour, an aqueous humour, and a crystalline lens, similar to the features of the eye of higher animals. This invertebrate cannot be declared to be a relative of the higher vertebrates without scrapping every taxonomic system in existence. Unless it is a direct relative of vertebrates, however, there is no way for the evolutionist to account for the origin of the eye of the cuttle-fish without declaring either that the eye of vertebrates and the eye of the cuttle-fish developed along *similar lines*, but *independently*,

Evidence from Classification

or to say that God miraculously intervened in one case or the other to produce an eye according to the pattern of the other eye ! To make matters worse, we find that the pecten has a whole row of large eyes along the two edges of the mantle. When these eyes are examined in detail, we find that each of them has an optic nerve, a cornea, a choroid, and a crystalline lens, making it very similar to the eyes of vertebrates and the cuttle-fish !

Now from the point of view of the evolutionary classificationist, there is no possibility of asserting that these eyes (i.e., the eyes of vertebrates, cuttle-fish and pecten) evolved from each other or from a similar source. Moreover, unless a directive intelligence is admitted, it is absolutely unthinkable that complex structures such as eyes, having all these details in common, together with a similar function, should have evolved by purely chance means *independently* ! The mathematical law of probability absolutely forbids any such coincidence as that. Two things might be similar in one or two details by chance, but never two complex organs having a similar function ! Chance independent development of such organs can be definitely ruled out as even a possibility in the case of even *two* such organs, much less of *three* independent chance origins ! But if chance is to be ruled out as a possibility in the case of the origin of the eyes of vertebrates, cuttle-fish and pecten, what shall we

Basis of Evolutionary Faith

say of the innumerable other cases of *convergence* where genetic relationship must be denied ?

Certainly no one would assert that mammals have any relation to sharks, and yet we find in certain species of sharks the placental method of embryonic development similar to that found in all mammals ! And to cap the climax we find the same method of caring for the embryo in the case of certain ascidians, or sea-squirts ! In the sharks the placenta is developed from the umbilical vesicle, while in mammals it arises from the allantois, a totally different structure. Thus we must declare in these three cases, where relationship is out of the question, that the placenta has developed independently !

Now, as Price points out,¹ whenever we see two similar structures, we are prone to think that there must be common inheritance from a remote ancestor. The trouble is that if we follow this rule in the cases cited, we get into serious difficulty. Were we to say that mammals are derived from sharks and ascidians because of the placental method of reproduction we should have to say that mammals are descended from cuttle-fishes because of the eyes and ears common to these two groups.¹ Price asserts that there are a sufficient number of similar cases of convergence to make it necessary upon such fallacious

¹ Price : *op cit.*, p. 128.

Evidence from Classification

reasoning to declare that almost every genus was derived from a number of different ancestral branches ! In other words, as Price says, " every single genus . . . would, on this basis, seem to have far too many ancestors " ! ¹

Ridiculous as is the situation in which the evolutionist would find himself if similarity of structure is to be taken as the criterion of classification, the other horns of the trilemma are even more uninviting. We have already pointed out the difficulty of one horn of the trilemma, namely that of saying that these similar structures arose independently, by chance. The law of probability makes such a supposition unthinkable. The third horn of the trilemma is equally impossible for the evolutionist. Suppose he were to admit that these independent structures were produced by the purposive activity of God. In just what way would such an admission differ in principle from the doctrine of creation ? It would involve an innumerable number of new beginnings in the making of convergent structures in different lines of animals. Such structures would in no way be inherent in the parent stocks of the different lines, but would be beginnings *de novo*, in each different line. Moreover it would have to be asserted that they were brought about by supernatural power, that is, that in each case

¹ Price : *op cit.*, p. 128.

Basis of Evolutionary Faith

such changes could never have occurred by the operation of inherent natural laws. But if this must be admitted, just how does it differ from the Christian doctrine of special creation, except in detail ? The only difference that appears on the surface is that the Christian doctrine of special creation asserts that God created the separate *groups* of animals and plants, while such a view would have to assert that God created *de novo* certain *organs* in certain groups of animals ! Certainly the evolutionist who would make such an admission has in reality abandoned every real principle of evolution !

The whole question of classification is based upon the fallacious assumption that *similarity of structure demands genetic relationship* ! The difficulties to which such an assumption leads have been pointed out above. This assumption gains its plausibility from the fact that in the ordinary cases of species, and in many cases of genera as well, similarity of structure is *actually* due to genetic relationship. There is no valid reason to believe that such species as dogs and wolves are not genetically related, when we find that they interbreed and produce fertile offspring. However, when we go back of the species which freely interbreed and produce fertile offspring to the groups which will not, and assert that because they contain similar characteristics, or similar organs, they are therefore genetically related, we

Evidence from Classification

are going into the realm of speculation, and in the face of such facts as have been cited above, we are indulging in very bad speculation at that !

The whole classification system is a pure deduction from the theory of evolution itself. If evolution were proved true, of course it would tend to explain much of the similarity upon which classification is based, as due to genetic relationship, though in view of the facts cited above, it seems almost inconceivable that anything could independently prove evolution. Evolutionists are entirely unjustified, however, in assuming that similarity proves genetic relationship, and therefore proves evolution. Even at best such an argument would be merely a presumptive one, and as we have already shown it would prove too much, for it would make nearly every genus have near ancestors or relatives in several different genealogical trees !

An illustration taken from O'Toole's book *The Case Against Evolution*¹ will make the weakness of the similarity argument plain. In the inorganic world we have a similarity which no one alleges to be due to genetic relationship, and yet one which is even more striking in many respects than the similarity of structure upon which classification systems are based.

¹ This book by George B. O'Toole, is one of the best of the recent books on Evolution, for O'Toole is a biologist, and the book is written from a scientific point of view, by a scientist. It is understandable by anyone.

Basis of Evolutionary Faith

“ Among the chemical elements of inorganic nature we find analogous uniformities or ‘ family traits,’ which, in the absence of any reproductive process whatever, we cannot possibly attribute to inheritance. Mendeleeff’s discovery of the periodicity of the elements, arranged in the order of their atomic weights, is well known. At each interval of an octave, a succession of chemical types, similar to those of the preceding octave, occurs. Hence elements appearing in the same vertical column of the Periodic Table have many properties in common and exhibit what may be called a family resemblance. . . . Here analogous chemical composition, produced in accordance with a general law, results in uniformity that implies a similar, rather than an identical, cause. The hypothesis of parallelistic derivation from similar independent origins accounts quite as well for the observed uniformities as does the hypothesis of divergent derivation from a single common origin. Why, then, should we lean so heavily on the already over-taxed principle of inheritance, when parallelism is as much a possibility in the organic world as it is an actuality in the inorganic world ? ”¹

Now this offers a very striking analogy to what we find in the organic world. All the common similarities between species can be

¹ O’Toole : *ibid.*, p. 56.

Evidence from Classification

accounted for on the theory that God created certain "kinds," and that these kinds broke up into the various species as we have them in the world to-day, just as many of the physicists now think was the case in the inorganic world. In that case similarity of form, outside the limits of the groups which are actually genetically related, is amply accounted for on the theory that a Personal God was back of the whole process, the similarities being due to their all having the same author. In other words, a single mind accounts for the similarities as well as, and even better than, biological descent from a single ancestor. In such a case the fundamental similarity between different types is no more significant than that between different books by the same author, or between pictures painted by the same artist. Their similarities are all due to the fact that they are the product of a single Mind.

It is the habit of some evolutionists to sneer at such a line of argument and to inquire why an omnipotent God should be obliged to create so many animals on the same general plan.¹ Such statements seem to assume that God could not or would not create individuals with common points of similarity and with their bodies built on the same general scheme, but that if He created at all He must have created every separate individual

¹ Cf. Parker : *What Evolution Is*, p. 27.

Basis of Evolutionary Faith

species of plant and animal with no points of similarity with other species ! We might with justice reply to such an objection with the question as to why He should not create them similar ? As a matter of fact, however, would not a world order in which every species was different from every other species be far harder to attribute to one God than the world order with its similarities such as we see around us ?

Is it not plain, then, that the argument from classification proves nothing except that it is possible so to classify the various forms of life ? Moreover, as we have found, the evidence which has come to light from the phenomena of convergence really offers definite proof against evolution, for it shows the impossibility of these similar structures being derived from each other, and the equal impossibility of their having been developed independently by merely natural forces. It is absolutely necessary to account for these facts by postulating a creator for them, and if for them, why not for the various "kinds," which the Book of Genesis teaches ? The theory of a common mind back of the similarities of the organic world seems far more logical than the theory of descent, especially if we hold, as the present writer does, that in many cases the species or even genera are descended from common original types created by God.

CHAPTER X

ALLEGED EVIDENCE FROM COMPARATIVE ANATOMY

THE alleged evidence from comparative anatomy is so closely involved with the question of classification, that it is difficult if not impossible to make a logical separation between the two lines of evidence or argument. In discussing the question of classification we have already passed into the realm of comparative anatomy for the simple reason that classification is *based* on comparative anatomy. That is, the only way in which a system of classification can be built up is by observing the similar and dissimilar structures of organic life. That, however, is just what comparative anatomy is, namely the study of these likenesses and differences.

“Comparative anatomy, as the name implies, is the comparison of structures and tissues in the whole range of animal life. Such comparison leads to the conclusion that in the animal kingdom there are several distinct types of structure, characterizing the grand divisions of the kingdom. Within any one of these grand divisions may be found almost endless diversities of structure,

Basis of Evolutionary Faith

all of them obviously different modifications of the same fundamental plan. . . . Superficially examined, the following structures would seem to have little or nothing in common : the foreleg of a lizard, the wing of a bird, and of a bat, the burrowing shovel of the mole, the flipper of a whale, the foreleg of a horse and the human arm and hand. When, however, all the structures are carefully dissected and the bones, muscles, and nerves are compared, it becomes increasingly apparent that the plan of structure is the same throughout, modified to serve different uses of running, flying, burrowing, swimming and grasping. . . . Modification is brought about by the reduction and even the suppression of certain parts, the enlargement of other parts, and, very much more rarely, by the addition of other parts.”¹

As can be seen from the above quotation, which puts the argument for evolution from comparative anatomy in such an attractive form that one is almost hypnotized into assent to it, we have already discussed comparative anatomy in discussing classification, and for that reason, the discussion in the preceding chapter needs little amplification here. In fact the only reason for discussing comparative anatomy at all in a separate chapter is because the evolutionists

¹ W. B. Scott : *Theory of Evolution*, p. 42, 43.

Evidence from Comparative Anatomy

themselves make such a distinction; and in order to cover all the various lines of argument which they advance, it seems best to discuss this subject briefly even at the risk of repeating ourselves.

Now we are not disposed to minimize the strength of the argument here advanced by Professor Scott. Of course we can point out the flaws in the argument without much difficulty. We can point out the fact that there is no way known to biologists whereby fundamental parts of vertebrates may be modified by "the enlargement of other parts and . . . by the addition of new parts." There is no way by which such a thing can be brought about now in the laboratory, and there is no real evidence that it has been brought about in the past. The whole matter is one of inference from the theory of evolution itself. If evolution is true these various modifications must have been brought about some way or other. Evolution must be true, therefore the fact that these modifications have been brought about (*sic!*) proves the theory of genetic relationship, and that of course proves evolution. As was said in the previous chapter, the whole argument rests on the assumption that likeness *proves* relationship, when as a matter of fact, it does not, the evolutionists themselves being witness.

Nevertheless, when all this is said, one must

Basis of Evolutionary Faith

admit that the various groupings of similar animals and similar parts of animals which fill our museums make a powerful appeal to the mind and imagination, when we see the rows of horses and camels, etc., from the smallest to the largest, all so carefully arranged to depict the development of the various evolutionary lines. It seems an almost irresistible deduction from such exhibits, that these various species of similar animals must be genetically related, yet as a matter of fact we know that such a deduction is merely hypothetical, and is based upon the assumption of the thing to be proved, namely that there has been such development. Such exhibits might lose much of their plausibility if one were to arrange a similar exhibit of animals which are similar and yet which evolutionists themselves declare to be unrelated. Suppose one were to put alongside the various horses of the exhibit in the American Museum of Natural History, the thylacine, or so-called 'Tasmanian wolf, and a real wolf and a dog ! To the observer at a distance they could hardly be distinguished in appearance, yet evolutionists tell us that they are genetically as far apart as the poles, for the thylacine is a *marsupial* animal, while the others are placental mammals ! Here is a case where the evolutionists must admit that resemblance in no way proves genetic relationship.

Evidence from Comparative Anatomy

Or suppose we take the case of the lobster and the African scorpion. "A large pinching claw, or chela, for example, occurs in two organisms belonging to the phylum of the arthropods, namely, the lobster and the African scorpion. Both chela are practically identical in structure, but, unfortunately, the chela of the lobster arises from a different appendage than that from which the scorpion's chela emerges. . . . Hence, technically speaking, the two chela are utterly unrelated structures."¹ Here again the evolutionist is forced to admit that resemblance in no way proves genetic relationship. In view of these facts, we are justified in asking a pertinent question. Since we know that similar structures can arise independently from *different* structures, why may they not arise independently from the *same* structure? In other words, since we know that the chela of the lobster and the scorpion have not evolved from each other, but have originated entirely independently, why may not the arm of a man, the flipper of a whale and the foreleg of a horse likewise have arisen independently, with no genetic relation whatever? Even on evolutionary principles it is difficult to see why this may not have been so.

If we are to throw overboard the obvious explanation of these similarities as due to a

¹ O'Toole : *op. cit.*, p. 61.

Basis of Evolutionary Faith

Creator who consciously designed these animals according to a common plan, and if we are to play fast and loose with the law of probability as was pointed out in the last chapter, then even according to evolutionary principles any structure could produce a structure similar to that in another animal, without the animals being in any way related genetically ! The lobster and the scorpion, the thylacine and the wolf, the cuttle-fish and the vertebrate, and the innumerable other examples of similarity which evolutionists declare has not proved genetic relationship, condemn the whole argument from comparative anatomy to the scrap-heap. If similarity does not prove relationship in one case, why should it prove it in the other ? Remember there is no way of proving any relationship between these various similar animals, for the ancestors are all dead without leaving a genealogical tree, and unless the animals will interbreed to-day, there is no way, aside from the similarity of form or structure, of proving that they have ever been related. However, if similarity of form or structure does not *always* prove relationship, as according to the evolutionists it does not, what evidence is there to think that it *ever* proves relationship ?

In view of such facts, one cannot comprehend how evolutionists can toss aside the alternative explanation of all these similarities in such a

Evidence from Comparative Anatomy

cavalier manner. It seems such a reasonable explanation to say that these similarities are due to the same plan of an omnipotent, omniscient Creator, that one is at a loss to explain why evolutionists do not consider it worthy of credence. This plausible explanation lies embedded even in the subconscious thinking of the evolutionists themselves, as witness the quotation at the beginning of this chapter. When Professor Scott uses expressions like "the same fundamental plan," and "the plan of the structure is the same," he is bearing testimony to the fact that it is possible to trace a plan in nature, throughout the organic world, and that such a plan is a plain indication of a Mind back of the plan ! The very fact that such a plan can be seen in nature is a strong indication that instead of such similarity being due to lineal descent, it is rather due to the mind of the Creator who planned it all. As long as there is such a plausible explanation of similarity of anatomical structure, I cannot credit an evolutionary explanation of it. There are too many facts against it. Similarity does not always prove relationship, and in such cases the law of probability is against the independent development of the observed similarities by merely natural forces. The explanation of a thinking Creator is the only one which will fit all the facts.

CHAPTER XI

THE ARGUMENT FROM EMBRYOLOGY

THE first argument for evolution from embryology is found in the observed fact that embryos in the earliest stages more or less closely resemble each other. The germ cells of birds, reptiles and mammals, aside from the fact that the number of chromosomes is different in the cells of each species, are closely similar under the microscope. As they develop, the earliest stages are almost identical in outward appearance. This fact led to the formation of what is called "Von Baer's Law," that embryos of closely related species are more alike than the adults of these species and that these resemblances are the greater in the younger embryos. Externally, in a large number of cases, this seems to be true, but the discoveries along the lines of genetics and cytology have antiquated most of these arguments.

While the resemblance may be very marked superficially in the earliest stages of the embryos, we have reason to believe that in reality, in the ultra-microscopic region of the chromosomes in the developing cells, the differences are just as

The Argument from Embryology

marked and striking as in the adult organisms. All the hereditary characteristics are now thought to have correspondence in genes located serially on the chromosomes of the germ cells, so that any superficial similarity of outward form has no significance whatever, for it represents merely the ideal form for the development of any embryo, while at the same time, internally, beyond the reach of the microscope, there is probably all the difference in the world between the different embryos, and this difference is located in the genes of the chromosomes in the cells. Accordingly we hear far less to-day of the proof of evolution from Von Baer's Law, because it is generally recognized that these differences are after all superficial, and really mean nothing, while there is actually present the real and deep-seated difference in the genes of the chromosomes, capable of producing the different organisms. Thus we read :

“The problem of heredity may be more clearly understood by recognizing that the characteristics of the organism are specific at all stages of its existence. The egg of the star-fish is just as much a star-fish as the adult is.”¹

Still more important is it to remember that in the earliest phases of embryonic life there are fundamental differences even in form between

¹ Kellicott : *General Embryology*, p. 28.

Basis of Evolutionary Faith

the species, in spite of the similarities. The following quotation points out one important difference which appears in the embryonic structure of two organisms which evolutionists declare are closely related.

“Evolutionists claim that . . . the lowest vertebrate, the *Amphioxus*, is related in structure to *Balanoglossus*, a living species of worms, and that the two probably had a common ancestor.

It is well known, however, that there are radical differences between the embryos of vertebrates and invertebrates. Worms and other articulates in embryo lie doubled backwards around the yolk, while all vertebrates are doubled in the opposite direction.”¹

Now certainly a remarkable fact such as this ought to be taken seriously into account by those who claim that the recapitulation theory is true. The recapitulation theory, which teaches that “ontogeny recapitulates phylogeny,” or in simple language, that the history of the development of the individual contains in brief compass the history of the development of the race, is the second line of embryological argument of the evolutionist. Now if evolution is true, and if the recapitulation theory is likewise true, certainly there ought to be some record of such an important fact as that referred to in the above quotation,

¹ Fairhurst : *Organic Evolution Considered*, p. 145.

The Argument from Embryology

in the embryonic development of the vertebrates. Of course no one claims that the developing embryo passes through *all* the stages of the development of the phylum.¹ But as a matter of fact, all the first part of the history of the phylum is omitted in the development of the individual.²

In the history of the embryo itself, moreover, the order of development is sometimes the reverse of what should be expected. G. Stanley Hall, in his well known work on *Adolescence*, says : " The work of Appel, Keibel, Mehnert, and many others has demonstrated abundant inversions of it " (i.e., the recapitulation theory), " The heart, e.g., in the individual develops before the blood-vessels, but this reverses the phylogenetic order. The walls of the large vessels develop before the blood-corpuscles, while the converse was true in the development of the species."³ Scott also quotes Gebenbaur as follows : " If it once be admitted that not everything in development is palingenetic, that not every ontogenetic fact can be accepted at its face value, so to speak, it follows that nothing in ontogeny is immediately available for the critique of embryonic development. The necessary critique must be drawn from another source."⁴ He then quotes E. B. Wilson as follows : " It

¹ W. B. Scott: *op cit.*, p. 58. ² Fairhurst: *op. cit.*, pp. 147, 148.

³ G. Stanley Hall : *Adolescence*, Vol. I, p. 55.

⁴ W. B. Scott : *op. cit.*, p. 60.

Basis of Evolutionary Faith

must be evident to any candid observer, not only that the embryological method is open to criticism, but that the whole fabric of morphology, so far as it rests upon embryological evidence, stands in urgent need of reconstruction.”¹ Yet apparently this warning of three decades ago had little effect on evolutionary embryologists, for they have gone on persistently, up to the present time, reiterating these old claims that embryology presents definite proof for evolution.²

It is claimed that many structures which have been lost in the course of evolution by adult organisms, are retained at least temporarily by the embryos of such adult organisms. As Adam Sedgwick pointed out some time ago,³ “It is clearly impossible to get any direct evidence, because . . . we have no knowledge of the ancestors of living animals ; but if we assume the evolution theory to be true, there is a certain amount of indirect evidence which is directly opposed to the view. As is well known, living birds are without teeth, but it is generally assumed that their edentulous condition has been comparatively recently acquired, and that they are descended from animals which at a time not very remote from the present, possessed teeth.

¹ Cf. *Wood's Hole Biological Lectures* (1894), p. 103.

² Cf. article on *Embryology*, by Edward Grant Conklin, in *Creation by Evolution*, edited by Frances Mason (1928).

³ Cf. article on *Embryology* in the *Ency. Brit.*, 11th edition.

The Argument from Embryology

Considering the resemblance of birds to other terrestrial vertebrates, and the fact that extinct birds, not greatly differing from birds now living, are known to have had teeth, it must be allowed that there is some warrant for the assumption. Yet in no single case has it been certainly shown that any trace of teeth has been developed in the embryo. The same remark applies to a large number of similar cases ; for instance, the reduced digits of the bird's hand and foot and the limbs of snakes." Professor Sedgwick then proceeded to show that the embryonic organs which are not present in the adult animal, have, in all probability, a definite function to perform in the embryo, and that their presence is accounted for by *this* fact rather than that they are there because some remote ancestor possessed them in the adult state.

Probably this is the explanation of the remarkable facts cited by E. W. MacBride in the following paragraph :

"The typical Ctenophora are ovoid organisms of glassy transparence which swim in a vertical position in the sea. Their locomotor organs are eight vertical rows of vibratile combs, each comb consisting of a short horizontal row of powerful cilia fused together at their bases. A certain creeping organism resembling a flat worm, called *Coeloplana*, had been believed by some

Basis of Evolutionary Faith

zoologists to exhibit ctenophore affinities but its relationships were very obscure. Quite recently a Japanese zoologist ¹ has described its development. Its larva is a small typical ctenophore with eight rows of perfectly formed combs ; these it discards after swimming for a few hours—it sinks to the bottom and flattens out and gradually assumes the adult structure. Another extraordinary organism, named after its discoverer Tjalfjella,² was discovered amongst dredgings collected in the Arctic Ocean. This creature superficially resembled a sponge or an ascidian. It was gelatinous and sessile and seemed to consist of a pair of upright tubes like towers, whence proceeded smaller tubes which ramified in its substance. In pockets connected with these smaller tubes were discovered groups of the larvæ. These were small ovoid creatures of typical ctenophore structure, with the eight vertical rows of combs.”³

The above paragraph presents a very strong argument for the recapitulation theory. Were such facts taken by themselves the recapitulation theory would seem to be established. However, such facts do not stand by themselves, and we

¹ Taku Komai : *Notes on the Coeloplana bocki and its development, Annotationes Zoologicales Japonenses*, Vol. 9 (1920). (Quoted in article in *Ency. Brit.*, 13th edition, Vol. I, p. 976.)

² Mortensen : *Ctenophora, Danish Ingolf Expedition*, Vol. 5, No. 2 (1912). (Quoted in *Ency. Brit. Ibid.*)

³ *Ency. Brit.*, Vol. I, p. 976, 13th edition.

The Argument from Embryology

must consider them in the light of other well established facts. The fact that the cilia are necessary in the larval phase of the *Coeloplana*, and are of actual present use in that stage, is an ample explanation of their existence in the life of that organism, rather than that at some time in the past such a stage was the final stage of that organism. According to the gene theory of cell life, each part of an organism is produced by a gene in the chromosomes, and there is no way whatever by which a change of environment or habits could change the inheritance factors of the organism, unless the genes for producing a characteristic were previously present in the chromosomes. MacBride, therefore, simply ignores all the newer knowledge from genetics when he goes on to say :

“The present condition of the race both as regards structure and habits has been produced as a consequence of migration from the original haunts of the race. Change of habits therefore reveals itself as the great driving-force in evolution, and change of habits usually means the choice of a different type of food.”¹

In this paragraph MacBride assumes that environment and forced change of habits produce heritable changes in the inheritance factors of an organism. This is absolutely contradicted

¹ *Ency. Brit.*, Vol. I, p. 976, 13th edition.

Basis of Evolutionary Faith

by the facts discovered in genetics, along the line of the gene theory, as has been already pointed out. Nothing would seem to be more firmly established as a general principle in biology than the fact that the mere need for a certain quality does not in itself call forth that quality in the organism, though evolutionists constantly assume that that is the case. Even were we to admit that there may be some few instances where environmental changes are inherited (a fact which is highly open to question), such exceptions merely make the rule that they are not, as a usual thing, inherited, stand out more clearly. To say, therefore, as MacBride does, that "change of habits therefore reveals itself as a great driving-force in evolution," is not only unfounded assumption, but directly opposed to all recent discoveries in genetics.

But why, it may be asked, do we find the eight rows of combs with their typical cilia in the *Coeloplana* if these organisms are not closely related, and if the ancestor of the *Coeloplana* did not live in the typical Ctenophora way, with the eight combs and cilia? This is of course the old argument from comparative anatomy, and the answer is the same. If God planned them both there is no reason why the same typical combs and cilia should not be found in numbers of different organisms, without their being necessarily

The Argument from Embryology

related genetically. It must be admitted that the cilia are of use to these organisms now at a certain stage of their development as larvæ, and that fact explains their existence amply. The combs with the cilia represent merely the ideal form for such organisms as they came from the Creator.

No book on evolutionary embryology would be complete without a treatment of the so-called "gill-slits," and "gill-arches" present in the human embryo at an early stage. That they are present is undeniable, but that they are really identical with the gill-slits of the fish, or that they embody evidence of a fish ancestry of human beings, is an entirely different proposition. "Beginning as a set of similar arches, regulating the opening and closing of gill-slits, they become jaws, vocal organs, supports for the tongue, suspensory pieces for the mandible tympanic ossicles, and flapping external ears."¹ If in the later stages of the life of the individual they are used for such varied purposes, and if they are never actually used as gill-slits in the embryo, why refer to them as "gill-slits"? Of course the term is merely evolutionary propaganda, and assumes the thing to be proved, namely that these structures are *really* gill-slits. The fact that they may superficially resemble gill-slits in no way proves that they are gill-slits unless they are

¹ Wilder : *History of the Human Body*, revised 1924, p. 180.

Basis of Evolutionary Faith

so used, which they are not. As a matter of fact the resemblance is only superficial, for these slits are merely embryonic depressions, differing totally in construction from the gill-slits of fish, and developing into other organs in later life, so that whatever superficial resemblance they may bear at one stage may be accounted for as a part of the necessary development of the individual.

As a matter of fact in the case of these "gill-slits," as in all other embryonic arguments for evolution, we are dealing with arguments that have been completely antiquated by recent discoveries in cytology and genetics. The work of Morgan and others shows that when a gene crosses over from one chromosome to another, the quality lacking in the individual which does not possess the given gene, in the following generation, is *totally lacking, embryonically and in every other way!* For example, if the genes for producing wings in the *Drosophila* are lacking in one individual, we do not find embryonic wings, or vestigial wings, but simply no wings at all and no sign of the rudiments of wings! When a gene is lost, the quality which it represents is likewise lost to all following generations, not only in the adult, but in the embryo as well. It thus appears that even though the ancestors of man had gill-slits, if real gill-slits are not present in the adult man, the gene for producing them

The Argument from Embryology

has been lost, so that there should be no real gill-slits in the embryo. Therefore, even though we were to admit the truth of the evolutionary theory, the modern facts from genetics have antiquated all the old evolutionary arguments and alleged evidence from embryology.

In actuality, as Sedgwick claimed,¹ probably almost every feature of the developing embryo has either an embryonic or a potential use in the adult individual. The only exception to this is in the case of multiple genes for a single characteristic, where it is conceivable that the loss of most of the genes from the chromosome might leave a single gene or two to cause the production of a portion of the former quality, in a form which would be useless to the individual. Such cases, however, would be extremely rare, and usually the individual possessing such a mutation would be non-viable. Practically all other features of the developing embryo are already shown to be of definite use in the case of the higher animals and man. Any resemblance which exists between the development of the human embryo and those of lower animals can be amply explained if we remember that the same God made both after the same general plan, varying the plan to the needs of the individual and to the purpose of the Creator Himself.

¹ Cf. article on *Embryology* in the *Ency. Brit.*, 11th edition.

CHAPTER XII

EVIDENCE FROM VESTIGIAL ORGANS

ONE of the important lines of evolutionary argument has been the one from the presence of a number of what have been called rudimentary or vestigial organs in man, and in various lower animals. Scott puts this argument very well as follows :

“The only satisfactory explanation of such useless remnants is that their possessors are descendants of ancestors in which those organs were fully functional. It seems quite absurd to assume that, in a separately and specially created animal, useless structures, reminiscent of other animals in which the same structures are useful and valuable, should be included, merely to indicate ideal relationships and community of plan.”¹

Scott then goes on to admit that many of what were formerly called useless rudimentary organs are now known to have a use in man, but states that this argument does not apply to many other

¹ W. B. Scott : *op. cit.*, p. 66.

Evidence from Vestigial Organs

cases, particularly to lower animals such as whales which have limb-bones in various stages of reduction, and to rudiments of limbs in snakes.

Scott makes a very important admission when he says that what were formerly thought to be rudimentary organs are now known in many instances to have very important uses. As a matter of fact, almost all of the so-called vestigial organs of man are now known to have definite uses either in the adult or in the embryo. Let us mention only a few of those often referred to in evolutionary literature. The first of these is the vermiform appendix, the inflammation of which causes appendicitis. According to Dr. D. K. Miller the appendix never was used as an extra stomach to aid in the digestive processes, because it is located at the end of the small intestine farthest away from the stomach, and empties into the large intestine, twenty feet from the exit of the stomach, where it would have been useless as a stomach, the principal digestive processes having already taken place before the food reaches that place.¹ O'Toole² declares that in man it secretes a fluid which aids in lubricating the large intestine, and does not perform the same function as the somewhat similar organ in birds or herbivorous mammals.

¹ Dr. J. K. Miller : *The Two Great Bible Plans Paralleled*, as cited by L. S. Keyser : *Problem of Origins*, p. 194.

² O'Toole : *op. cit.*, 296.

Basis of Evolutionary Faith

The coccyx was formerly considered a vestigial remnant of an ancestral tail, which through disuse became atrophied. As a matter of fact it performs one of the important functions of the abdominal cavity, in acting as one of the supports for the intestines in a human being who walks upright. Were it absent there would be no way of supporting the abdominal organs in walking or sitting. Moreover there are several small and necessary muscles attached to this bone, so that it is far from useless. There is no evidence whatever except in the imaginations of some evolutionists to show that it is the remnant of a tail in a mythical ancestor.

Other vestigial organs the presence of which formerly was used as an argument for evolution, are the ductless glands, such as the thymus, the thyroid gland, the pineal gland, the pituitary body, and adrenal glands, together with numerous other glands in various parts of the body. These are all without exception now known to perform very important functions, and are not in any way useless appendages of a former lower animal ancestry where they were used differently. As a matter of fact, man's ignorance as to the uses of various organs and parts of the body has over and over again been used to support the evolutionary hypothesis. The fact that no one as yet knows what use a certain organ of the body has, is no

Evidence from Vestigial Organs

proof that it has no use either in the adult organism or in the embryo. As O'Toole points out, the foetus is living under entirely different conditions before birth from those existing after birth, and perhaps many of the organs which seem to be useless appendages to us in the adult organism were in reality of use to the embryo, under the entirely different conditions of its existence.

The science of genetics, has, however, in reality antiquated all the old arguments about the use and disuse of organs causing their atrophy or disappearance in succeeding generations. A new environment can neither cause an enlargement of an organ nor call forth an organ where there was none before, nor can it cause an organ to become vestigial or to disappear through lack of use. Such myths have been definitely disproved by the new science of genetics. Moreover there is no way known to science whereby an organ can assume functions formerly not performed by it and transmit such inherited functions to the succeeding generations. That such a thing has ever occurred in the past history of the race is an unfounded assumption of the evolutionist. Geneticists have proved that organs disappear in one generation through mutations from within, either wholly or in part, and that use or disuse have had absolutely nothing to do with it.

Basis of Evolutionary Faith

But suppose we admit that there are some actual rudimentary organs in various animals or in man, for which there is no use either in the adult stage or in the embryo. Does that mean that such a fact supports evolution? Such a conclusion is not warranted, nor can it be maintained that such organs were formerly of use in a lower stage of existence of the ancestral species. In the first place it is to be remembered that geneticists have proved that mutations account for such losses or retarded development, that they always represent degeneration instead of progress, and that such mutations never take the individual out of the bounds of the species. In the second place, it is the original possession of the characteristic that is to be accounted for if evolution is true, and rudimentary organs offer no evidence at all on that phase of the subject. In the third place, original creation of various families or genera, with variation within the boundaries of the created "kinds" according to Mendel's Law and mutations through the crossing over of genes in the chromosomes, would account for these "rudimentary" organs fully as well as evolution can claim to do. We might go so far as to admit that such an organ was of use to the ancestors but has become useless to the descendants through a mutation. Since, however, such a variation would be within the bounds of

Evidence from Vestigial Organs

the original "kind" created by God, such loss or degeneration would in no way prove evolution from a single cell by means of resident forces !

Suppose a whale originally had hind-legs. Does that mean that it is a descendant of reptiles who walked on the land ? Perhaps, but is it not more reasonable to suppose that such rudimentary bones were used in a fin as a means of swimming, and that such a fin was later on lost through a mutation ? There is no reason for thinking that because the animal possessed such organs it was ever anything but a whale. As for the snake, the same thing can be said. But it is significant that Genesis iii. 14 may be interpreted as perhaps implying that there was a time when the snake did not crawl in the dust but walked. At any rate the *loss* of such organs, wholly or in part, would not make the individual any less a member of the ancestral species. We must insist in closing this chapter that the *loss* of a characteristic in whole or in part does not prove evolution in any real sense. It proves change, but change downward instead of upward ; and it is the upward change that must be shown to have occurred in order to prove evolution.

CHAPTER XIII

THE NUTTALL BLOOD TESTS

WE have now come to one of the most recent and widely heralded lines of proof for evolution, that of the precipitin blood tests. In 1904 Dr. George H. F. Nuttall, of Cambridge, published the results of a long series of original researches into blood-relationships among animals.¹ These tests are now widely accepted among evolutionary biologists as proving the various degrees of evolutionary relationship among mammals and lower animals. The tests are rather complicated ones for laymen in science to understand, but in brief they are as follows.

The sterile serum of the blood of man or of any animal is injected² into a rabbit over a period of several days, beginning with small doses and gradually increasing the dose, and after about five or six injections have been made, the rabbit

¹ Nuttall: *Blood Immunity and Blood Relationship*.

² Various methods of injection are used. Nuttall secured the best results by intravenous injection of the serum. Others have used intraperitoneal and subcutaneous methods of injection.

The Nuttall Blood Tests

is killed, from seven to twelve days after the last injection.¹ The blood of the rabbit is then collected, allowed to clot, and the serum drawn off from the clotted blood into sterile receptacles for future use. This serum is called the "antiserum" of man, or of the animal whose blood serum was injected into the rabbit. This antiserum is then mixed with the normal blood serum of various species of animals, and forms a white precipitate in varying amounts, depending, according to the evolutionists, upon the degree of relationship between the animal from which the antiserum was derived and the animal whose blood is being tested. For example, the antiserum for man, when added to the serum of human blood, produces a thick, cloudy precipitate in a relatively large quantity. When human antiserum is added to the sera of other animals, the amount of the precipitate is less in varying degrees. The evolutionary biologists assert that the amount of the precipitate varies with the degree of evolutionary relationship of the given animal to man.

At first sight this test seems to be a very powerful line of evidence for evolution. Indeed if evolution were proved to be true from other lines of proof, the precipitin test might possibly be used to determine actual blood relationship, if such relationship were established by other

¹ *Ibid.*, p. 59.

Basis of Evolutionary Faith

lines of proof. It is true that Dr. Morton¹ has pointed out some very striking discrepancies in the results of these precipitin tests. He has shown that as far as the test indicated, there was no difference in the degree of relationship to man between the lemur (a species of monkey) and the crab ! This fact has led most systematists in recent years to place the lemur on a separate branch of the evolutionary tree from that of the anthropoid apes.² No systematist would, however, go so far as to place the lemur and the crab in the same relative degree of relationship to man, simply on the strength of the precipitin tests, and unless the argument from the precipitin tests is to be discarded entirely, it should show the relative degree of evolutionary relationship in *every* case. Rodents, Ungulata, and Cetacea (whale, etc.) all reacted to the test, to a very limited extent, thus proving, if the test were a true one, that they were closer to man than the lemur !

When the antisera of animals were used, results opposed to the ordinary evolutionary classification of animals were many times obtained. For example, in the quantitative tests,³ the antiserum of a donkey reacted quite differently with donkey (a) and donkey (b), the first giving a percentage

¹ H. C. Morton : *The Bankruptcy of Evolution*, p. 185 ff.

² G. Elliott Smith : *Essays on the Evolution of Man*, p. 3.

³ Nuttall : *op. cit.*, p. 333.

The Nuttall Blood Tests

of 100, while the second gave a percentage of only seventy ! In the same test a horse gave a percentage of fifty-nine. Does that mean that donkey (b) and the horse were more nearly related than the two donkeys ? The antiserum of a zebra showed that the zebra was related to donkey (a) on a scale of eighty-three, while to donkey (b) the relationship was only sixty-six, the horse having a degree of relationship of the same figure, sixty-six ! This would indicate that the horse and donkey (b) were related to the zebra in the same degree.

Results such as these tend to cast doubt upon the validity of the whole method. When the antiserum of a pig was used, man, the tiger, the whale-bone whale, and the antelope all showed the same degree of relationship to the pig ! One may well be somewhat sceptical about the whole method in the face of facts such as these.

Nevertheless, one must admit that these tests cannot be too lightly dismissed. Taken as a whole they do offer a striking demonstration of the fact that there is an apparent chemico-physiological similarity between the bloods of different animals, and that in the main these similarities correspond roughly to the degree of relationship indicated by the evolutionary tree of the systematists. As was shown above, there

Basis of Evolutionary Faith

are many discrepancies in this genealogical tree, but in the main, certain features of the genealogical tree seem to correspond to the similarities of the blood tests.

Such similarity, however, in no way proves an *actual* genetic relationship according to the scale of similarity of the precipitin tests. Let us remember just what materials were used in the tests. Sterile serum was used originally, so that there was no living matter used throughout the whole process. Now it is a well established fact that it is the germ cell and not the blood or the blood serum that is the carrier of heredity factors, so that when we deal with the serum we are dealing with something out of the direct line of descent, which does not carry factors for heredity. All that possibly can be present in the sterile serum which was originally injected into the rabbit is a *lifeless chemical substance* ! When this is added to the blood of man or an animal, a chemical reaction occurs which produces the precipitum. As far as positive knowledge goes, we cannot tell *why* the precipitum is deposited, or why there should be more of it with one blood than with another. At any rate it can only be because there is more of the chemical substance producing the precipitum in one case than in the other. The evolutionist assumes that the reason why there is more of the chemical

The Nuttall Blood Tests

substance in one animal than in another, or rather why there is more similarity between the chemical construction of the serum of one animal and another than between the chemical construction of the serum of the first animal and a third animal, is that the first two animals are closely related evolutionally. But is it not just as logical to hold that there is this close similarity in the construction of the bloods of different animals, because there is a similarity in the animals themselves as they were created? In other words the similarity in form of the animals may have been produced by the Creator who made them after a similar pattern, and the similarity in the chemical construction of the blood serum may well be a corollary of the similarity in form, habits, food, and environment of the different animals.

Whether the similarity in the chemical construction of the blood serum is due to genetic descent from the same ancestry, or whether it is due to the similar creative plan of the same Creator, science is in no position to determine. One explanation is just as plausible as the other, and unless evolution can be proved in some other way, this evidence, like the evidence from comparative anatomy, must be ruled out as inconclusive. It is simply another case of analogy of structure not proving evolutionary ancestry.

Basis of Evolutionary Faith

No evolutionist would claim that the blood serum is the carrier or producer of hereditary factors, and unless that be claimed it is difficult to see how a greater or lesser similarity of chemical construction can necessarily prove evolutionary relationship. We can only conclude that this evidence, like the evidence from comparative anatomy, would only be valid in case it could be established upon other grounds that the same Creator did *not* create the animals after the same general plan.

CHAPTER XIV

GEOGRAPHICAL DISTRIBUTION

A STRONG argument for evolution has always been made from the distribution of plant and animal species over the face of the earth. Certain plants and animals are found only in South America, others in Australia, and so on. A species in one part of a country differs widely from a species found in another part, while in between the two regions species which make the gradation between the two first species may be found. A species is said to have originated in a certain locality and to have spread to other regions from that place as a centre, varying as it went, and gradually evolving into other species in all directions from the starting point. All this is said to prove evolution. Prof. D. M. S. Watson states the argument concisely as follows :

“ The distribution of animals and plants over the earth’s surface is, further, such that it cannot be explained except by assuming that evolution has occurred. If certain types have had their origins in certain areas, and have then spread thence, the facts are intelligible, but not other-

Basis of Evolutionary Faith

wise. In the same way, the fact that oceanic islands contain but a very limited fauna and flora, and that in oceanic archipelagos, the types of animal life are often represented by different species on each different island, is readily explicable on the idea of chance spreading, followed by isolation and consequent evolutionary divergence.”¹

The facts of geographical distribution are indeed remarkable and puzzling, not merely to the man who believes in creation of the original “kinds” by God, but also to the evolutionist. Why was it that kangaroos evolved only in Australia? If it be replied that the reason kangaroos developed only in Australia was because chance variation cannot produce two species alike unless they come from similar ancestors, we want to know why and how it happens that we find the only marsupial animals outside Australia in the opossums of America and the marsupial frogs of S. America? Did the opossum and the marsupial frog come from the same ancestry as the kangaroo? The evolutionist to be consistent must of course answer that they did. But if so, how are we to explain the geographical distribution of these marsupials? Are we to hold that they strayed around the bridge of land between Australia and Asia,

¹ *Ency. Brit.*, 13th edition, Vol. I, p. 1070.

Geographical Distribution

across the Behring Strait, down through North America, to the regions where they are now found in the Americas? But if so, why do we find no intergradients anywhere along the line of march, either to-day or geologically? Certainly they ought to have left some record along the line somewhere. All the puzzles are not for the anti-evolutionist to solve when it comes to geographical distribution! The fact that opossums have been found as fossils in Europe only complicates the problem of geographical distribution.

There is an assumption beneath all the arguments from geographical distribution which is certainly open to question, to say the least. In fact there are two assumptions. The first is that while it would be possible for the life which is said to have started with a single cell, to have spread throughout all lands according to evolutionary principles, it would nevertheless have been impossible for species created in one region to have spread to other regions, without having evolution enter into the case! Certainly it would have been as possible for created species to spread to other regions as it would have been for evolved species to spread!

The second assumption is that it would have been necessary for God to create all species in one locality, if He created them at all, and that

Basis of Evolutionary Faith

it would have been impossible for Him to create certain species in different parts of the world. Certainly there is no intrinsic reason why God could not have created the kangaroo in Australia and other animals in other regions. Moreover, it would certainly have been as simple a matter for the opossum to have spread from America to Europe or from Europe to America, after they were created as it would have been for the evolved species so to spread. If species were not specially created, at least in some cases, for special environments, how are all the many remarkable cases of adaptation to particular environments to be explained? How are we to explain the fact that the polar bear has fine hairs on the soles of his feet which enable him to walk on the ice in the polar regions, while the hairs are missing from the feet of bears in temperate regions? It seems probable that the polar bear could not have existed on the ice packs of the Arctic region without these hairs on the soles of his feet, yet why are they found only on the feet of this animal and not on the feet of other bears? Are we to suppose that the polar bear lived on land until he became possessed of hairs on the soles of his feet and suddenly realized that now he could swim in the icy waters of the Arctic and climb out upon the ice packs successfully? Even on the old theory of the evolutionists, that

Geographical Distribution

environment calls forth necessary organic adaptations, that would have been impossible in the case of the polar bear, for he could never have entered the environment which could call the necessary change forth, until *after* the change had occurred. If he had attempted to enter before the change occurred, the penalty would have been death !

Of course the modern science of genetics has rendered this hoary evolutionary theory, that environment produces heritable changes adapted to the particular environment, completely antiquated. Heritable changes are produced only by changes in the relative location of genes on the different chromosomes, and these changes occur irrespective of environment. Moreover these changes never *add* qualities not previously possessed. They *eliminate* qualities but never add them. The conclusion under such circumstances seems inescapable that God created at least some species adapted only for some special environment, and that if, after they were created, they strayed from that environment, or if the environment changed, they perished.

But, the evolutionist inquires, how are we to explain the intergradients between two species of a genus in different regions ? This is admittedly the hardest problem in regard to geographical distribution, for the opponent of

Basis of Evolutionary Faith

evolution to solve. Of course we must not lay too much stress on these intergradient species. In too many cases the gradation is artificial and theoretical rather than dependent upon actual facts of distribution. That is, the intergrades are taken from wherever they can be found, and arranged in the required series arbitrarily instead of depending upon actual geographical location of the different species in a regular series between the two points. The evolutionist can always justify this by the claim that the intergradient species have wandered from the place where they originated and where they should be found to-day. Nevertheless the facts of these intergradient species cannot be lightly dismissed entirely.

There seems to be only one way to account for such facts, and that is by accepting the view here advocated that in many cases the present species do not represent the "kinds" originally created by God, but that there has indeed been variation from those original "kinds" to the present species. If this view is adopted, the plausibility of the argument from intergradient species disappears. Ordinary variation and mutation within the genus, or perhaps in some cases within the family, starting from a fixed point as a centre, and spreading in all directions, varying as it goes, would account for all these

Geographical Distribution

intergradients as well as the theory of evolution. We must constantly remember that evolutionary arguments are based on the similarities between different species of a genus, which make it probable that they have a common origin. If this fact be admitted in all cases where the species can interbreed and produce fertile offspring, the arguments have no direct application to families and orders, except analogically, and the plausibility of evolution disappears.

There is one more important point to remember about these intergradient species. The evolutionist assumes that the species spread originally from a single centre, and then kept on going along the radii of the circle, always in the same direction, evolving as they went. But as a matter of fact, why should they have done so? Why didn't they turn and go backwards after each evolutionary change, as well as forward along the original radii? But if they did that, we should find almost all the variations in the same place, in any part of a given region. Naturally not all of them would survive, so we might find some regions where many intergradients are lacking. That being the case there would be nothing remarkable if the evolutionist actually finds the intergrades he is particularly searching for in any region between the two given points, where the type species are located.

Basis of Evolutionary Faith

But let us remember while we are doing this according to evolutionary principles (neglecting all the species which do not fit in with our preconceived plan), that if the species were created separately, even without the assumption that they have varied within the limits of the original "kinds," we would find them in much the same relative locations as we would find them if evolution were true. Whether God created them all in the same region from which they spread throughout the earth, or whether He created them in different centres throughout the different continents, they would inevitably spread in all directions. Some species would be killed out in a given region, while others would be killed out in another region, but on the whole they would eventually settle down to the balance of life which we see to-day everywhere.

Moreover, it is just as scientific to say that God created different kinds of plants and animals in different centres throughout the world, as to say that the species evolved in one locality and spread from there throughout the world by means of the hypothetical "land bridges," such as "Gondwana Lands" or "Atlantes," for whose existence there is no other evidence than the fact that the evolutionary distribution of plants and animals demands it. Moreover, modern theories of the construction of the

Geographical Distribution

interior of the earth are against such vast disturbances of land equilibrium,¹ for if the earth has a solid core rather than a liquid centre, as was formerly supposed, there seems little possibility of a vast continent sinking in the ocean as these hypothetical lands are supposed to have done.

But even were these hypothetical land bridges realities, there is no *a priori* reason why evolution should be postulated to account for the distribution and variation of plants and animals. Might not the plants and animals have spread from the places where they were created just as easily as they must have spread from the point where the evolutionist assumes they evolved? Must we say that the Almighty was compelled to create the animals in *every* place where they could exist? Does the fact that kangaroos could exist in other regions of the earth besides Australia necessitate our believing that God would have been forced to create them in the other regions if He were to create them at all? Evolutionists sometimes argue as if when God exercised His creative powers, He had to exercise them in a blanket fashion to cover all possible places with every species which could exist there! Let us leave God a little leeway for choice and discrimination!

¹ Coleman: *Smithsonian Institution Report* for 1916, pp. 269-271, quoted by O'Toole, p. 114.

Basis of Evolutionary Faith

Even the evolutionist will have to admit that even were the facts all admitted to be true, geographical distribution does not give any direct proof of evolution. Creation by a rational God accounts equally well for these same facts, and avoids most of the difficulties which beset the evolutionary view of distribution. The evolutionist will have to go elsewhere for his proof for the theory.

CHAPTER XV

EVIDENCE FROM PALÆONTOLOGY

THE modern theory of organic evolution would probably never have come into existence had not geologists paved the way for it with their theory of uniformity,¹ and alleged evidence that there was a progress from simple forms of life to highly differentiated forms of life shown in fossil animals and plants found in the rocks of successive geological ages of the past. The theory of successive geological ages stretching over millions of years,² with organic life gradually evolving into higher species from age to age, is to-day the chief prop of evolutionary faith. Other lines of evidence at best are inconclusive, but it is claimed that the fossils offer definite proof that evolution has occurred. The late

¹ The theory of uniformity is the theory which says that the land has been either rising out of the ocean or sinking beneath the ocean all over the world by a very gradual process throughout geological time, so that land and water have changed places many times, thus burying plants and animals as fossils. The theory accounts for the fossils by this gradual and uniform process of the sinking and rising of continents. In other words, processes now at work account for all the fossils of past time.

² Cf. chart in article on "Palaeontology" in *Ency. Brit.*, 13th Ed., Sup. Vol. III, p. 15, after Pirsson and Schuchert, 1915; issued by Osborn in 1918. Also chart at top of page 14, where the minimum time for evolution of life is set by Barrell at 1,200,000,000 years.

Basis of Evolutionary Faith

Wm. Bateson, the English geneticist, brought this out very clearly as follows : " Contemporary variation certainly may occur ; but of the contemporary origination of new species, or of the occurrence of genetic changes which can be colourably interpreted as likely to lead to the production of incipient species, no indication has been found. *That the forms of life have been evolved from dissimilar precedent forms we know from the geological record*, but as to the process by which this evolution has come to pass we are still in ignorance."¹ It is thus seen that the faith of present day evolutionists rests principally upon the truth of the evolutionary interpretation of the geological record.

Now in interpreting the geological record, we are by no means shut up to the evolutionary interpretation, even granting that there have been successive geological ages in the past ; and, as we shall later see, there is serious doubt about the reality of these geological ages. But even granting that there have been these numerous ages, each millions of years long, there is an alternative explanation of the appearance of progressive forms of life in each age. If we admit the existence of God, and must posit the divine creation of the first forms of life, there is no *a*

¹ Wm. Bateson : " Genetics," *Ency. Brit.*, 13th Ed., Sup. Vol. II, p. 165. Italics mine.

Evidence from Palæontology

priori reason why we should question the possibility, at least, of a progressive creation of the various forms of life from age to age, culminating in the creation of man. Competent Hebrew scholars assure us that the Hebrew word "yom," translated "day" in the Bible, is used of long periods of time in other places in the Bible, and that there is no reason in the text itself for refusing to accept the geological "period" interpretation of the creative "days" in Genesis I. Thus even the most conservative Christians could find the view of a progressive creation of various forms of life over successive geological ages, in harmony with the Bible.

Another alternative is found in the theory advanced by some that the geological ages referred to by geologists occurred in the period of time posited between the first and second verses of the first chapter of Genesis. This of course may be a theoretical possibility, if we suppose that the animals and plants of that time were all destroyed by some great catastrophe, and a new series created by God as described in the following verses of Genesis I.

A third possibility which would give a still more plausible explanation of the geological series without positing evolution, is the theory advocated by Professor H. W. Magoun, Ph. D. (Johns Hopkins University), in the *Bible*

Basis of Evolutionary Faith

Champion of January and June, 1930. Dr. Magoun would identify the first "day" of Genesis I, with Archaean Time, the second "day" with the Silurian Age, the third the Devonian, the fourth the Carboniferous, the fifth Mesozoic Time, the sixth Cenozoic Time, even including its two divisions, the tertiary and quaternary epochs. He believes that the actual history of the earth is somewhat the same as orthodox geologists teach, but that God instead of creating the species complete, caused them to originate from something much different, so that the effect was somewhat similar to evolution, except that God's creative power produced the progressive changes, with new forms of life brought out of preceding forms of life perhaps very different from each other. He calls this view Xenogenesis. He believes that there were three great catastrophes which ruthlessly destroyed life on the earth, one at the close of the Carboniferous Age, one at the close of Mesozoic Time, produced by a change of climate, and one at the close of the Ice Age, which last was the Deluge of the time of Noah. His whole theory would account for the appearance of new species through the successive ages, without positing what is commonly treated as evolution. The system which he posits would certainly be in harmony with the Biblical facts, and if there have actually

Evidence from Palæontology

been successive geological ages, would harmonize well with the geological evidence. Of course, if there have actually been no successive geological ages, this interpretation of the geological facts would likewise have to be abandoned.

It is thus seen that anti-evolutionists are by no means shut up to the rejection of the successive age theory in order to explain the geological record. However, we must admit frankly that if there have been geological ages succeeding each other in the past, much plausibility is given to the claims of the evolutionists that the facts of geology show that there has been an evolution in the past, however ignorant we may be of its causes.

Serious doubt, however, has been thrown on the actuality of these alleged successive ages, by George McCready Price and others. Prof. Price has been denied professional standing among geologists,¹ and he is alleged never to have studied under a recognized geologist, but such arguments *ad hominem* affect the validity of his arguments and evidence in no way. His professional standing might affect the value of his professional opinion, but the question of the truth of the evidence he presents is separate from the question as to whether he is considered an authority by geologists.

We are confronted at the outset of our study

¹ E.g., *Science*, N.S., Vol. LXIII, No. 1625, pp. 195-2 .

Basis of Evolutionary Faith

of the fossils with the fact that nowhere do we find all the layers of strata of all geological ages. But if such is the case, how do geologists know that the rocks of one age, containing, for example, mammals, are younger than the rocks in another place containing, for example, invertebrates? Every geologist admits that it is not because of either mineral characteristics or the relative degree of crystallization of the two sets of rocks. In the last analysis, there is only one way the geologist can tell the age of rocks in different regions, and that is *by the fossils which they contain* ! If mammals are found as fossils, these rocks are dated in the later geological ages, while if only certain invertebrates are found, they are dated in the earlier ages. But how do geologists know that the invertebrates found as fossils in surface rocks in one place, are older than mammals found as fossils in surface rocks elsewhere, unless the rocks containing invertebrates underlie the rocks containing the mammals in that place? Geologists answer that the rocks with their fossils are correlated throughout the world, and that correlation then used as a basis for deciding the age of given rocks, but actually what is done is to assume the concept of evolution when the above mentioned fossils are dated. It is difficult to see how geologists can escape the charge of arguing in a circle—that is, by

Evidence from Palæontology

assuming the truth of evolution, they prove the truth of the successive age theory, and then use the successive age theory to prove evolution. Such an assumption might be warranted if the order of the rocks always corresponded to it, but such is not the case.

In the first place the same strata may be found several times in the same vertical section, as is the case with the coal seams in Western Pennsylvania in some places. Are we to suppose that the rocks of the Carboniferous period were deposited at many different times in the course of geological history?

In the second place we find in many places that the rocks of one age lie conformably over rocks of a much earlier age, with no erosion or deposition to indicate the passage of the alleged millions of years between the deposition of the two layers. Apparently the rocks were deposited at about the same time, yet because the fossils indicate different ages, geologists say that millions of years passed between the deposition of the two strata.

In the third place in many regions so-called "older" rocks are found *over* so-called "younger" rocks. The rocks may or may not be disturbed or tilted, but in many cases they are practically parallel with each other, with nothing to indicate their relative ages except the fossils contained

Basis of Evolutionary Faith

in them. In fact in some cases geologists thought the present order of rocks the order in which they were laid down until a closer study of the fossils caused them to change their opinion, as in the case of the Salt Range in North West India.

Now if evolution is true, geologists must account for such a condition of the rocks by a hypothetical "thrust-fault," that is they must say either that the rocks were folded over until the younger rocks underlay the older, or they must say that a fault occurred in the surface of the earth, and that the section on one side of the fault was raised into the air and pushed over the surface on the other side. Such "thrust-faults" are often observed on a small scale in mountainous regions or in excavations. The great difficulty in applying the thrust-fault theory to explain the inverted order of rocks referred to above, is the vast territory involved, and the difficulty of attributing such a movement to known physical laws. For example, let us examine the Alpine "over-thrust."

"The movement was both vertical and thrusting from the south and south-east, from the southern portion of Tethys, elevating and folding the Tertiary and older strata of the northern areas of this mediterranean into over-turned, recumbent and nearly horizontal folds, and pushing the southern or Lepontine Alps

Evidence from Palæontology

about sixty miles to the northward into the Helvetic region. Erosion has since carved up these overthrust sheets, leaving remnants lying on foundations which belong to a more northern portion of the ancient sea. Most noted of these residuals of overthrust masses is the Matterhorn, a mighty mountain without roots, a stranger in a foreign geologic environment.”¹

Another example is found in America, in Glacier National Park, and extending several hundred miles into Canada. The southern part is called the “Lewis overthrust.” “That the mountain mass of the park has been thrust far to the north-east . . . is clearly shown, but the full extent of that movement may never be known, for it is difficult, if not impossible, to locate the place from which the mass was overthrust. Nevertheless, some idea of the extent of the movement may be obtained by measuring along the railroad the distance from the fault line where it crosses the valley at Fielding to the east boundary of the park, which agrees in a general way with the eastward extent of the overthrust mass. This distance is about fifteen miles.”²

Notice, first, the distance these mountain masses are said to have travelled—15 miles in one case and sixty miles in the other—and

¹ Pirsson and Schuchert: *Textbook of Geology*, 1920, Vol. II, p. 924.

² U.S. Geological Survey, *Bulletin* 600, 1914, p. 12.

Basis of Evolutionary Faith

second, the direction in which they are said to have travelled. We are asked to believe that mountains, thousands of feet high, were pushed up in the air and then pushed along on top of the lower strata for a distance of sixty miles in the Alps and fifteen miles in the Rockies ! Think what friction would have done to the rocks at the plane of joining, if one mountain mass thousands of feet high were pushed over the other ! Yet in some cases "the apparent conformity is perfect, even in the clearest sections, and the difficulty of drawing an exact line between the two series is further increased by the close lithological resemblance."¹ What, may we ask, could have produced such a condition ? M. R. Campbell, the author of *Bulletin 600* quoted above, gives us this explanation :

"Deep-seated forces in the earth had been gathering energy until finally the stresses became so great that the rocky crust began to move. It is not known definitely what causes such stresses in the rocks. They may be produced by the shrinking of a slowly cooling globe ; but be that as it may, there is positive evidence (!) to show that after the plains were laid down, a great pressure developed in the mountain rocks, which caused them to move toward the plains. The

¹ *Annual Report*, 1886, Part D., p. 17, *Canadian Geological Survey*. The quotation here given refers to the northern part of this "thrust-fault," in Alberta, Canada, near Banff.

Evidence from Palæontology

rocks of the plains were, however, immovable, and as the stresses accumulated they found relief by the folding of the rocks. . . . *The geologist learns to accept such things without question*, for although he may not be able to realize fully the forces involved in a movement of this sort, the evidence of it is so plain as to be incontestable.”¹

Certainly a geologist who accepts a thing like this does so “without question” ! The evidence that is so plain “as to be incontestable” is of course based principally on the fossils. The fossils on top are Cambrian, while those beneath are Cretaceous ! This much is incontestable, therefore, since evolution is a fact, the rocks on top must have been pushed up and over those beneath !

Let us look, however, at the hypothetical forces which are said to have produced the “over-thrust.” Is there any force or resultant of forces which could have produced this result ? The rocks are said to have been pushed thousands of feet into the air, and then pushed along on top for sixty miles in the Alps. We might believe that a force acting outward from the interior of the earth broke the strata and pushed them into the air, but the same force, even assisted by gravity, could hardly have pushed these mountain masses along the surface for sixty miles.

¹ U.S. Geological Survey, *Bulletin* 600, 1914, p. 10. Italics and exclamation point are mine.

Basis of Evolutionary Faith

Remember that we are not dealing with liquid lava, but with rocks made by sediment deposited in water ! The Cambrian rocks could not flow horizontally along the surface after they were deposited, for they must, according to the evolutionists, have been solid rocks for millions of years before the Cretaceous rocks, which now lie under them, were deposited. How could gravity in such a case have anything to do with it ? In the first place, if the fault were a clean break, and the force applied evenly underneath the pushed up rocks, nothing would happen except the elevation of the central rocks, with possibly rock slides along the outer edges for a short distance, say a half mile or a mile at the most, in which case the rocks would be broken and crushed in the process.

In the second place, if the force were applied only at the centre of the elevated mass, as would probably be the case, the whole surface would be pushed up around a central point or line, with the elevation increasing until a fault occurred, or until the angle of friction for the central mass was reached. This angle of friction would not be reached until the surface was nearly perpendicular to the normal surface of the earth, unless another pressure from beneath developed meanwhile in another place, causing a sharp, clean fault, so that pressure beneath the mass between

Evidence from Palæontology

the two faults elevated the whole mass between these faults, on an incline. The whole mass would not begin to move until the angle of friction was reached for the whole mass. This angle of friction on the inclined plane would be very great before the mass could begin to move at all, while in order for the mass to move sixty miles, the upper end would have to be elevated above the normal surface an untold number of miles. Meanwhile we encounter another difficulty at the bottom of the incline, where the second fault occurred. If the elevated mass is to move smoothly over the neighbouring surface, the neighbouring surface will have to be elevated on an incline sufficient for the upper mass to slide over it. Since the upper mass is to move sixty miles over the lower mass, in order for it to keep moving, the lower must be lifted on an incline an untold number of miles into the air till its angle of friction is reached. That in turn makes it necessary for the mass which is to move to be elevated twice as high into the air. But there is still another complication before our mass begins its sixty mile journey ! The rocks are held together by cohesion, so that in the whole mass the angle of friction would be greatly increased beyond the angle of friction for a normal inclined plane, before there would be any downward movement at all. This would

Basis of Evolutionary Faith

probably mean that the mass at the top would have to be elevated at least a hundred miles before movement commenced.

Nor are the difficulties of the problem all met above. Since cohesion has held the mass together far beyond the angle of friction for a normal inclined plane, when at last the mass began to move let us ask ourselves what would happen? Would it not under such conditions make slow movement impossible? The mass would begin to slide down hill for sixty miles with increasing momentum until it reached the bottom, when the inconceivable momentum of the masses in the rear would crumble the strata below them out of all recognizable shape!

Remember that our flight of fancy above is simply dealing with conditions which would exist if there were any such thing as a real thrust-fault of such an extent as must have occurred if the successive age theory is correct. The fact that the strata as we find them now are fairly conformable in many if not most places, seems to rule out even the hypothetical possibility of such a thrust-fault occurring with the aid of gravity.

The writer recently received an ingenious attempt at an explanation of the mechanics of such a thrust-fault, from a correspondent who is an amateur geologist. This correspondent

Evidence from Palæontology

assumed that "a fault-break occurs in a group of stratified rock and takes the form of an inclined plane. Then, if the same condition of stress (see works on isostasy and allied topics for causes of stress—I think they are generally recognized as fundamentally gravitational) continue, there will come a second displacement in which the strata on one side of the fault plane will tend to glide over and to cover over the group on the opposite side. Let us suppose that this displacement averages barely more than one foot a century. . . . Then the overthrust would have extended to a distance of one mile in the course of about 500,000 years. To reach sixty miles would take about 30,000,000 years at this rate."

There are, however, several difficulties connected with this theory. As we have already pointed out, the angle of friction for a vast mountainous mass sixty miles long would be so great that the mountains would have to be elevated at least 100 miles before movement would commence at all, and since cohesion of the rocks would increase the angle of friction beyond the normal for an inclined plane, when at last a downward movement commenced, it is difficult to see what would hinder a sudden rapid downward movement, culminating in a cataclysm for the mountains involved. Our correspondent assumed that earthquakes were

Basis of Evolutionary Faith

the result of accumulated conditions of stress, and that the gradual movement was produced by the earthquakes, until the final movement of sixty miles in 30,000,000 years resulted.

The fundamental difficulty with such a view is that we are dealing with a vast tract of land sixty miles long covered with mountains, which must be treated as a unit. The whole territory must first have been elevated sufficiently to move downward as a unit before any thrusting due to gravitation on an inclined plane could begin. In other words, suppose we assume, as do the evolutionists, that a settling of the earth's surface in one place causes it to rise in another, with the second place of elevation producing a fault-break, and the elevated portion assuming an inclined plane. This whole process must be *complete* before an earthquake could produce the *first* thrust over on to adjacent rocks, and the angle of friction must be great enough for the whole mass to move, or an earthquake will be powerless to produce the thrust. But when that angle of friction is finally reached, as has been shown, instead of a mere foot of movement a century, what would stop the downward movement of the rocks? Would they not continue with accelerated movement to the bottom of the sixty mile slide? And when they finally reached the bottom would anything be left of the strata

Evidence from Palæontology

formation ? The fact that no such breaking of the rocks has taken place is proof that nothing of this kind ever occurred.

Is not the fundamental error of the geologists the assumption that anything can happen if given time enough ? Whereas if a thing can never get started, all the time in eternity will not bring about its accomplishment. Moreover, what real proof is there that there is any rising or falling of the earth's surface to the extent demanded in these theories ? Is not the fact of the various fossils in the surface of the earth after all the only direct proof ? But that again is assuming the truth of evolution, the thing to be proved. If the modern view that the centre of the earth is a solid and rigid mass is correct, it seems impossible that there should ever have been a rising or falling of the surface of the earth. Geologists base all their explanations of successive ages on such a gradual rising or sinking of some part of the surface of the earth ; and if that has never taken place, there is no way remaining for these ages to have been brought about. Apparently only a cataclysm produced by some external cause could have swept the waters over the land with such force as to destroy life and bury it thousands of feet deep in the strata of the earth. If a cataclysm or cataclysms have occurred to produce the fossils it is no longer

Basis of Evolutionary Faith

necessary to assume the passage of millions of years, unless we assume the truth of evolution which would demand such periods of time.

From what has been said above, it seems difficult to find any place for gravitation as a cause or one of the causes producing a "thrust-fault." M. R. Campbell, the author of *Bulletin* 600, suggests that it might have been caused by the shrinking of a slowly cooling globe. But what are the mechanics of a slowly cooling body? In the case of non-conducting bodies like the earth, the outside would cool first, contract, and probably produce great cracks in the surface, while the cooling of the parts beneath would gradually bring these cracks together, until the whole ball was somewhat as it was before except that it would be somewhat smaller. Even were we to assume that an eruption of inside matter occurred, the rocks would be merely pushed into the air to fall in ruins on each side of the centre of eruption. The stratified rocks show no such effects.

To sum up, is there any known cause which could push a portion of the earth's surface over other strata for sixty miles? Not even a collision of the earth with another planet or star would produce such a result, as is proved by the meteors which struck the earth in Siberia some years ago. The rock would be melted by the contact if the

Evidence from Palæontology

meteor were large enough, and there is no such evidence in the places in question. As we have repeatedly said, the wrong order of the fossils constitutes the sole proof of the thrust-faults.

“Stresses,” caused by “deep-seated forces in the earth,” are said to have produced this sliding of mountain masses along over other strata for sixty miles. But do deep-seated forces in the earth act around right angles to push mountains like the Alps sixty miles? Is there any conceivable combination of forces which could produce such a result? Gravitation is the only force to co-operate with forces from within the earth, and, as we have already seen, there seems to be no way it could have produced the given result, even in combination with eruptive forces from within.

It is impossible to say how much of the earth's surface presents up-side-down conditions of the fossils. Many such places have already been discovered. In Eastern Tennessee and Northern Georgia there is a strip of territory 375 miles long and eleven miles wide where Cambrian or Lower Silurian strata lie on top of Carboniferous strata. In China also there is a strip of territory 500 miles long where such up-side-down conditions of the order of the fossils exist. Another instance has been found in India: “In north-west India, in the so-called Salt Range, Cambrian beds, with a fauna quite distinct from any known

Basis of Evolutionary Faith

in the other provinces, rest upon red sandstone and shales, which contain a great bed of rock salt from which the range takes its name. From their position it would appear as if the rock salt deposit is of early Cambrian or pre-Cambrian age, and therefore the oldest on earth. More recently it has been suggested however that this rock salt and the enclosing beds are of Tertiary age, and that the Cambrian beds overlies them as the result of a great overthrust, or possibly an overturn fold. This appears to be the true relationship.”¹

This latter example is particularly instructive, and indicates that if geologists could assume for many years that the rocks lie here in the position in which they were deposited, and then in the following years are able to reverse their previous decision, there can be little or nothing in the appearance of the rocks themselves to indicate a fictitious phenomenon such as a “thrust-fault.” The fossils are unquestionably the principal criteria for deciding the age of the rocks, thus assuming the truth of evolution. Grabau says : “Undoubtedly the safest and most reliable means for the correlation of the formations with the type section is found in the organic remains or fossils which occur in the strata. . . . This method is sufficiently exact for most purposes,

¹ Grabau : *Textbook of Geology*, Vol. II, p. 254.

Evidence from Palæontology

and serves all the requirements for the correlation of geological systems in their occurrence the world over.”¹

As Price points out, when one uses this method for correlating formations the world over, one is assuming that at the particular period in question only the life of that particular period in the scale of evolution existed throughout the world. But how can geologists be certain that Tertiary animals did not exist on land somewhere while Cambrian beds were being formed elsewhere in water? Is not the only way he can know this, by assuming the truth of evolution, the thing to be proved?

The use of “index” fossils is of interest in this connection. When a certain kind of organic life is found only in one formation in a series, it is assumed to be typical for that formation, and wherever, throughout the world, the same fossils are found, the rocks are assumed to be of a similar age. This makes it possible for the evolutionist to escape from any difficulty which the order in which the rocks are found may produce. All that it is necessary for him to do is to declare the formation in which the index fossil is found to be the same as that in the type section, and if older index fossils are found in the strata above it, a thrust-fault is postulated to

¹ *Op. cit.*, p. 31.

Basis of Evolutionary Faith

account for the discrepancy ! O'Toole remarks : " The game he plays can never be a losing one, because he gives no other terms than : ' Heads I win, tails you lose.' " ¹ When the position of the index fossils renders other explanations difficult, there is still one more device in reserve. In speaking of fossils which appear to be found in the wrong formation, Grabau says : " Others there are which pass beyond the condition reached by the average of the species, and so foreshadow the characters which will be normal for the race at a future time. These are called *accelerated* individuals or species." ²

But, it may be asked, why do we find as a rule the lower forms of life as fossils in the lower strata, and the higher organisms in the strata above them ? Does not this indicate that the lower organisms lived and died a long while before the higher organisms appeared on the scene ? This objection is after all the crux of the whole question of whether the fossils do or do not prove evolution. Of course, as has already been shown, there are many places where the rocks are found in a different order, but nevertheless, as a rule it is true that lower organisms are usually found at the bottom and higher organisms in the upper strata.

There is, I believe, an explanation of this

¹ O'Toole : *op. cit.*, p. 95.

² Grabau : *op. cit.*, p. 59.

Evidence from Palæontology

fact without positing evolution. The expedition of the "Challenger," and other more recent expeditions, have shown that few if any fossils are being formed to-day in the bottom of the sea or at the mouths of rivers. A gradual inundation of the land by the sea would hardly produce the fossils in the numbers in which they are found in perfect preservation in the rocks. Land animals would flee from the advancing sea. Those that died would have their bodies eaten by others, or would disappear through decay. Fish rot and fall apart soon after death. Many of the fossils apparently were buried in sediment while alive. The Devonian fishes found in the rocks of Scotland in such numbers apparently died in agony and were buried before they decayed. Even in times of severe flood there is not enough silt in the water to bury fish alive. Apparently the fish must have died in a great catastrophe which swept the sea across the land with such force that even the mountains and all loose soil were swept before it, burying animals and plants, trees and everything in the resulting sediment before moving things could completely escape.

Now suppose the life of that period was similar to the life of to-day. Would the resulting strata be a hodge-podge, or would they tend to be formed somewhat in the order in which they are found to-day? Where, for example, would

Basis of Evolutionary Faith

we expect to find most of the organisms whose powers of locomotion are limited? Would they not tend to be the first to be buried, and so be usually found in the lowest strata? Would not the fishes and weaker animals probably be the next to be overcome by the torrents of sediment? Would it not be probable that the higher animals would be able to swim longer in the waters and so be among the last to be buried? Would not the plants and trees tend to rise toward the top of the waters, and likewise not be found in the lower strata to any extent? Possibly other catastrophes at approximately the same time, before the rocks solidified, would disturb the strata and perhaps sweep lower deposits up over the upper ones in the waters, but in general it seems logical to expect the strata formed under such conditions to be pretty much the same as we find in the rocks to-day. Does not this theory account for the fossils quite as well as the theory of successive ages with its evolutionary implications?

But what caused the catastrophe or catastrophes? Recent studies of the moon seem to indicate that the moon was formed by the accumulation of smaller bodies floating in space until attracted to the moon. The craters which have been a puzzle to astronomers are thought to be possibly the pock marks of collisions with

Evidence from Palæontology

other bodies of matter. Since the moon has no atmosphere there has been no erosion, and these marks remain to-day. Now if the moon was formed in such a way, is there not a probability that similar collisions have occurred with the earth in the past? A collision with such a body hundreds or thousands of miles in diameter would be a terrible thing to contemplate. We know that something changed the axis of the earth in the past, and a collision might have done it. A wobbling axis of the earth would probably cause tides miles high to sweep over the earth with incredible velocity, and sweeping back and forth across the surface of the earth every twelve hours, they could easily carry mountains before them. The ebb and flow of such tides would account for the building up of mountains of sediment, and the shifting and tilting of the strata after the sediment had begun to solidify. Such a theory would account for the facts of geology without positing evolution, and would seem to explain the formation of fossils in their present order.

In view of these facts, and also of the other possible explanations of the order of the fossils, even if the successive age theory be correct, the evidence from palæontology, like the other lines of evidence, not only seems to fail to prove evolution, but seems to present much that tends to disprove it.

CHAPTER XVI

CONCLUSION

WE have now examined all the different lines of evidence on the subject of evolution. Is there any escape from the conclusion that evolution is not only an unproved theory accepted on faith by the evolutionists, but that it is a theory which contradicts what we know of the world of life to-day, as well as what we can discover through the testimony of the rocks about the life of past ages?

We have seen that science to-day must postulate a Creator or God to account for the origin of life, for it is absolutely unthinkable that such a complex structure as protoplasm could have originated by chance. But if God is brought in at the beginning of the process, why deny that it was possible for Him to create the finished forms of life if He so desired?

We have seen that the chromosomes teach us that there is a definite line between the species in the realm of the chromosomes themselves, which are the carriers of heredity. The fixed

Conclusion

amount of chromosome material in the different species varies among the species, and corresponds in no way to the scheme of evolutionary classification.

The evidence from genetics teaches us that while there is change in abundance in nature, that change is downward instead of upward, and that there is no known way by which a species can acquire characteristics which it did not previously possess. New characteristics are never made to-day either by nature or by workers in the laboratory ; what evidence is there that they have been originated by evolution in the past ?

The system of classification used by the evolutionists is purely arbitrary, and gets out of itself just what it puts in. The similarity and apparent relationships of many animals and plants can be accounted for by postulating a God who created them, quite as well as by assuming that they evolved from each other.

The evidence from embryology, vestigial organs and from blood tests might have corroborative weight in favour of evolution, if there could be adduced some positive proof in its favour, but the hypothesis of a God who planned the whole creation, after similar patterns, accounts for the facts quite as well as the theory of evolution.

The facts of geographical distribution likewise

Basis of Evolutionary Faith

might be accounted for by evolution, but they can be accounted for equally well by the theory of creation, with distribution from various centres afterwards. Here again we need positive evidence before the distribution of plants and animals can be accepted as corroborating the theory of evolution.

Lastly we have seen that the evolutionists all fall back upon the evidence from palaeontology as a last resort in attempting to prove the actual occurrence of evolution in the past. We have examined this evidence and find that there is much that directly contradicts the theory, while the facts which seem to support it can be explained by the theory of a catastrophe which produced the fossils at the same time. Moreover we have seen that even if the successive geological age theory be true, the fossils can be explained without postulating evolution.

The subject of evolution would be of merely academic interest were it not for the fact that it has become in the eyes of so many a universal law of nature, ruling our God as the Creator. The result is that the modern youth too often gets the idea that if evolution is true, the Bible is false. Theistic evolution, placing God at the beginning and all along the line, might possibly be harmonized with the Bible, but since very few evolutionists believe in such a theory, which

Conclusion

would harmonize with a conservative interpretation of Scripture, there is little use in discussing it. As was shown in Chapter IV, the kind of evolution that is taught by most scientists cannot possibly be reconciled with Christianity, and those Christians who claim that it can, give up the vital points of Christianity in order to do so.

The most effective way of combating these anti-Christian evolutionary views seems to be to disprove evolution, for such a course would at a single blow discredit the anti-Christian claims of the materialistic evolutionists and do much to restore the Bible to its rightful place as the Word of God, "the only infallible rule of faith and practice."

We cannot repeat the statement too often that theologians who oppose evolution are not therefore opposed to science. If they are opposed to evolution it is because they are convinced that evolution is not true science, and because they are convinced that there can be no lack of harmony between true science and the Bible. We have independent grounds for believing that the Bible is the Word of God, and we feel sure that God's book of nature will never contradict His revealed Word in the Bible. Certainly under these circumstances Christians are justified in withholding their consent to the anti-Christian and anti-Biblical views of the

Basis of Evolutionary Faith

materialistic evolutionist. The evidence seems to point against evolution of any kind when dispassionately examined, and there seems no reason to bow before the dictates of non-Christian scientists. At best it is a mere faith of the scientist, and the basis of this faith seems largely illusion.

SELECTED BIBLIOGRAPHY

I. IN FAVOUR OF EVOLUTION.

A. GENERAL.

Darwin : *Origin of Species*.

W. B. Scott : *Theory of Evolution*.

Vernon Kellogg : *Evolution the Way of Man*.

G. Elliott Smith : *Essays on the Evolution of Man*.

Parker : *What Evolution Is*.

Encyclopædia Britannica, Thirteenth Edition (1926):
"Evolution."

Frances Mason : *Creation by Evolution* (a symposium
by leading men).

Henshaw Ward : *Evolution for John Doe*.

Sir Oliver Lodge : *Evolution and Creation*.

Le Conte : *Evolution and its Relation to Religious
Thought*.

Osborn : *Origin and Evolution of Life*.

W. R. Matthews : *God and Creation*.

G. Stuart Gager : *Science and Theology*.

B. GENETICS.

E. B. Wilson : *The Cell in Development and
Heredity*. Revised Edition (1928). Best book on
the cell.

Jones : *Genetics*.

T. H. Morgan : *Evolution and Genetics* (1925).

T. H. Morgan : *The Physical Basis of Heredity*.

T. H. Morgan : *Theory of the Gene* (1930). Best
book on the gene.

W. Bateson : *Mendel's Principles of Heredity* (1913).

W. Bateson : *Problems of Genetics* (1913).

H. E. Walter : *Genetics* (1930).

E. G. Conklin : *Heredity and Environment in the
Development of Man* (1916).

F. A. E. Crew : *Animal Genetics* (1925).

F. A. E. Crew : *Heredity* (1930).

E. W. McBride : *Heredity* (1925).

J. A. Thomson : *Heredity*, Revised Edition (1926).

P. Kammerer : *Inheritance of Acquired Characters*
(1925).

Bibliography

Bibliographica Genetica.

W. E. Castle : *Genetics and Eugenics* (1924).

C. BIOLOGY AND EMBRYOLOGY.

G. G. Scott : *Science of Biology* (1925).

Schull : *History of Animal Biology* (1920).

Kellicott : *General Embryology*.

Wilder : *History of the Human Body*, Revised (1924).

Driesch : *Philosophy and Science of the Organism*.

Nuttall : *Blood Immunity and Blood Relationship*.

D. GEOLOGY.

Pirsson and Schuchert : *Textbook of Geology* (1920).

Grabau : *Textbook of Geology*.

Chamberlin and Salisbury : *Introduction to Geology* (1921).

E. Suess : *The Face of the Earth*, English Translation (1924).

U.S. Geological Survey, *Bulletin* 600 (1914). (This deals with the Lewis Thrust-Fault.)

Canadian Geological Survey, 1886, Part D. (This deals with the Canadian section of the so-called Lewis Thrust-Fault.)

2. BOOKS OPPOSED TO THE THEORY.

(No attempt is here made to list the names of all the books opposed to the theory, nor even to list all the best ones.)

✓ G. M. Price : *New Geology* (1923), *Phantom of Organic Evolution* (1924), *Evolutionary Geology and the New Catastrophism*.

✓ O'Toole : *The Case Against Evolution*. Best book on Evolution.

✓ Morton : *The Bankruptcy of Evolution*.

✓ Fairhurst : *Organic Evolution Considered*.

L. S. Keyser : *Problems of Origins*.

Allen : *Evolution in the Balances*.

✓ L. T. Moore : *Dogma of Evolution*. (Not wholly opposed to Evolution.)

✓ Th. Gracbner : *Evolution*.

✓ Williams : *Evolution of Man Scientifically Disproved*.



213

H21

Hamilton, Floyd E.

AUTHOR

Basis of Evolutionary Faith

TITLE

27658

S01326

213
H21

Bethel Theological

SEMINARY

LIBRARY

New Brighton, Minn. - 55112

27658

S01326

